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A Look at Health Risk-Taking Behaviors and Sensation Seeking in NAIA College Athletes

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Dedication

I would like to dedicate this dissertation to my mom, who has always been “on my side” and have been a constant source of love and support.

Acknowledgements

I would like to thank the members of my committee for their valuable contributions to this work. The guidance and advise provided by Dr. Fred Peterson, Dr. Carole Holahan, Dr. John Bartholomew, Dr. Randa Ryan and Dr. William Siler was timely, appropriate and appreciated. Dr. Heidi Isreal thank you for your patience and guidance with the data analysis. Lastly, to those administrators and athletic trainers who allowed me to come to their school to collect data.

A special "thank you" to all my friends, thanks for always bringing me up when I was down. To LM, thanks for the love and support, without you I would have no sunshine in my life. Lastly to Bailey, thank you for being my rock for the past 12 years.

A Look at Health Risk-Taking Behaviors and Sensation Seeking Behaviors in NAIA College Athletes

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The University of Texas at Austin, 2010

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Abstract:

Studies indicate a high level of risk taking behavior among student-athletes in the college setting. There are questions as to whether risk-taking behaviors stem from the unique social and academic environment experienced by intercollegiate athletes, or due to other factors such as sensation seeking or other personality traits, perceived norms, peer influence or an amplification of the common college experience of experimentation. However, most research has focused on student-athletes from the National Collegiate Athletic Association (NCAA). This study examined (1) health risk taking behaviors, (2) sensation seeking and (3) perceived norms among gender and sport-type (contact or non-contact) in a National Association of Intercollegiate Athletics (NAIA) population. Participants (N=63) completed a 78-item questionnaire and reported on risk-taking behaviors (alcohol, marijuana, gambling and sexual risks, for a 12 month period), sensation seeking and perceived norms. Findings from this research indicate that non-contact athletes are more likely than contact athletes to use alcohol during the season of

competition. Male and female athletes showed not significant differences in alcohol use, marijuana use and sexual risk behaviors, they did however, have significant differences in gambling behavior. High sensation seekers show strong, positive correlations with alcohol frequency and quantity during the off-season. Perceptions of others (athletes/teammates and general college population) health risk-taking behaviors are higher than their own behaviors. Additional research is needed in many of these domains to further elucidate the relationships and significance of these findings.

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RISK-TAKING BEHAVIOR

Chapter 1

Introduction

Headline: More college athletes have abortions to avoid losing scholarships (Ertelt, 2007). Headline: Pregnancy puts female college athletes in a bind (Baird, 2007). Headline: Two Fresno college athletes arrested in rape of 11 year old girl (AP, 2006). Headline: Longhorn football players arrested on drug charges (Staff, 2007). College athletes are often in the media spotlight relative to the magnitude of their school's athletic programs. But the headlines we would like to see are those that extol the wins and highlights of the team and its players, not those that bring the programs and their athletes into a negative spotlight. All of the behaviors mentioned in the above headlines are considered "health risk-taking" in the academic vernacular, because a majority of deaths in the United States are associated with unhealthy (risky) lifestyles. In the US, a number of risk-related health markers, including unintentional injury, binge drinking, drug use and sexually transmitted infections (Park et al., 2006) peak during the time of adolescence extending into adulthood, (now being termed "emerging adulthood"; Arnett, 2000). For example, according to the Centers for Disease Controls National College Health Survey (CDC/NCHS, 2008) unintentional injuries account for the 2nd leading cause of death for young adults between the ages of 18 and 29.

Although the stories mentioned above involve student athletes from the National Collegiate Athletic Association (NCAA) intercollegiate governing system, this problem is not limited to NCAA student-athletes. There is another, much less recognized intercollegiate athletic governing body: the National Association of Intercollegiate Athletics (NAIA). Because the NCAA is the larger of the two, encompassing more

schools and a higher number of athletes and, some would say, at a higher level of competition, we tend to hear about those athletes associated with the NCAA versus those that are a part of the NAIA or even junior and community colleges. I will explain, in detail, the major differences between these two governing bodies in the next chapter (see Table 1). Because all previous studies have focused on athletes from NCAA institutions, I have chosen to restrict my study to athletes from NAIA institutions.

The common perception is that athletes are individuals who are in tune with their bodies and behave in such a manner to emphasize, or maximize physical and emotional performance. However, literature suggests the prevalence of health risk-taking behaviors occur at higher levels among athletes than their non-athlete counterparts (Nattiv & Puffer, 1991, 1997; Ford, 2007; Martens & O'Connor & Beck, 2006). There are questions as to whether risk-taking behaviors stem from the unique social and academic environment experienced by intercollegiate athletes, are due to other factors such as sensation seeking or other personality traits, perceived norms, peer influence, or an amplification of the common college experience of experimentation. Regardless of the underlying cause or causes, quality of life concerns for student-athletes should be thoroughly investigated, and acted upon via services and programs that foster growth in responsible decision making. For example, a number of effective social norms programs have targeted specific subpopulations within the campus environment by employing media campaigns (Mattern & Neighbors, 2004), peer based programming efforts (Cimini et al., 2002), and workshop or counseling formats to reduce misperceptions and problem drinking (Barnett et al., 1996; Borsairi & Carey, 2000; Steffian, 1999).

Igra and Irwin (1996) defined risk-taking behaviors as those "undertaken volitionally, whose outcomes remain uncertain with the possibility of an identifiable negative health outcome" [pg. 35]. These behaviors are distinguished from sensation

seeking behaviors by an identifiable, plausible, risk for short or long term negative outcomes. Considerable variation exists in the amount and type of risk behaviors in which adolescents and young adults engage. Most people engage in more risky behaviors during their adolescence than at any other time in their lives (Steinberg & Belsky, 1996). Risk behaviors engaged in during adolescence can produce a profound effect on health status in adulthood, particularly when these behaviors begin in early adolescence. Health risk behaviors initiated in high school often continue during college years (Wiley & James, 1997). Risk taking behaviors do not exist in isolation but tend to be associated with each other in predictable ways (Irwin & Millstein, 1986; Jessor & Jessor, 1977; Mott & Haurin, 1987; Udry, 1988).

Furby & Beyth-Marom (1992) suggest that each time a person is presented with a risky behavioral choice, there is risk associated with engaging in the behavior and with not engaging in the behavior. For example, consider the choices presented to an adolescent or young adult asked to drive home from a party with a friend who is intoxicated. There are identifiable negative (e.g. being arrested, being hurt or killed) and positive outcomes (e.g. perceived as being cool, being a good friend) associated with getting in the car with that friend. Likewise, there are identifiable negative (e.g. losing the friend) and positive (e.g. avoiding trouble) potential outcomes associated with not getting into the car. Therefore, conceptualizing risk taking as a simple decision to engage in a potentially dangerous behavior grossly minimizes the complexity of these situations for the individuals in question and arbitrarily distorts attempts to study and understand the phenomenon.

Males tend to engage in more risk taking behaviors than females across all age ranges. Male children, adolescents and adults are more likely than females to take risks in situations when it is clearly a bad idea to take the risk. Females are more likely than

males to avoid risk taking, even in situations in which risk taking is likely to result in a more positive outcome (Byrnes, Miller & Schafer, 1999; Morrongiello & Rennie, 1998). However, the extent of those gender differences vary from age to age. For example, smaller differences exist during early adolescence compared to late adolescence. In addition, substantial gender differences exist for particular risk behaviors (e.g. risky driving), but there are minor or no differences for others (e.g. smoking) (Arnett, 1992).

Theories of Risk-Taking

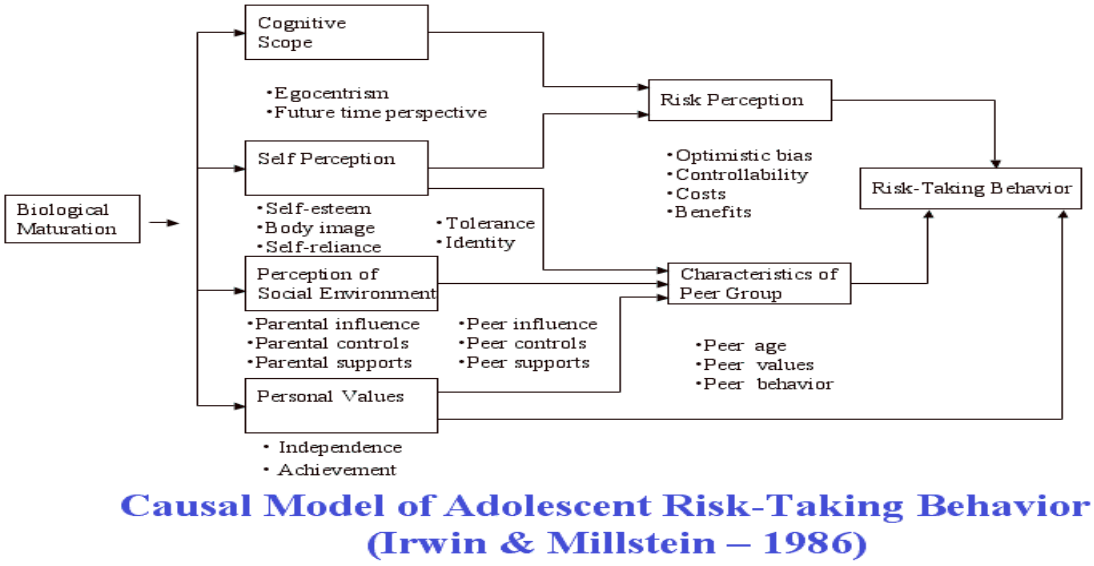
For the purpose of this study, health risk-taking behaviors will be subsequently referred to as "risk taking" and the context of such behaviors is relative to late adolescence and early adulthood (or emerging adulthood).

Understanding risk-taking requires consideration of many personal and social factors, including: biology, family, individual characteristics (such as beliefs & attitudes), peers, and environment. Theories of risk-taking generally take many or all of these factors into account to explain the motivation for risk-taking. The most popular theories/models include the following. The Causal Model by Irwin & Millstein (1986) integrates the epidemiological aspects, Zuckerman's (1979) Biological Model for Sensation Seeking delves into the mechanisms and processes, and the Social Norms Theory elucidates the influences that group norms can have on an individual and their behaviors. The Social Norms Theory is based on how incorrect perceptions of how our social groups think and act may influence individual behavior. By understanding these mechanisms we can develop health promoting and prevention programs. The sections to follow provide an overview of the above models/theories relevant to risk-taking and this research.

Causal Model

The Causal Model by Irwin and Millstein (1986; see figure 1) defines risk taking as "volitional behaviors in which the mechanism for onset and maintenance result from an interaction of maturational forces of the adolescent and the environment. Risk taking is participation in potentially health compromising activities with little understanding of, or in spite of an understanding of, the potential negative consequences" [pg. 83S].

Figure 1
Causal Model of Adolescent Risk-Taking Behavior (Irwin & Millstein, 1986)



The general theory reflected in the Causal Model integrated two areas of research that had been considered separately (1) the relationship of biological development to psychosocial functioning during adolescence (Brooks-Gunn, Peterson & Eichorn, 1985; Udry & Talbert, 1988; Udry, 1988) and (2) the relationship of risk-taking behaviors to psychosocial correlates of these behaviors (Jessor & Jessor, 1977; Jessor, 1986). The Causal Model (Irwin & Millstein, 1986) states that timing of biological maturation

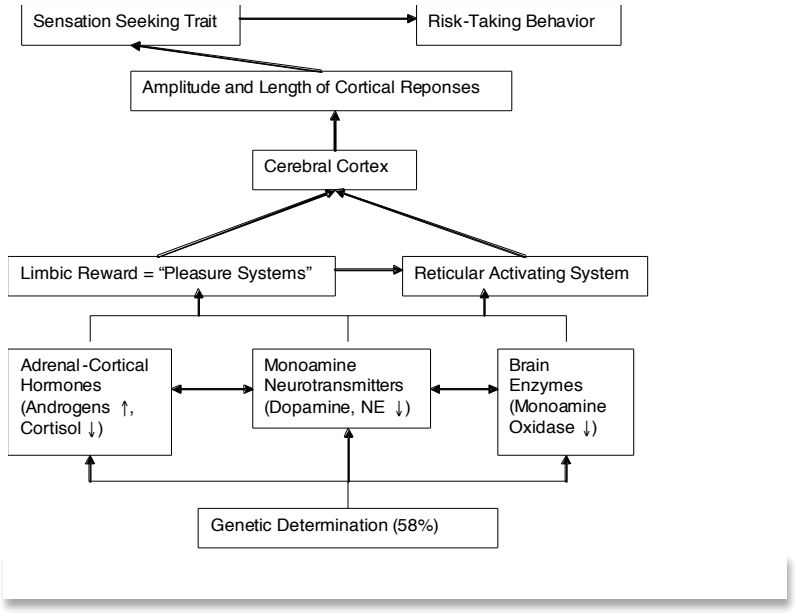
directly influences four psychological factors: (1) cognitive scope, (2) self-perceptions, (3) perceptions of the social environment and (4) personal values. The four psychological factors are hypothesized to predict adolescent risk-taking behavior through the mediating effects of risk perception and peer group characteristics. Behavior results from the interplay between the biopsychosocial processes of adolescence and the environment. Often such behaviors have uncertain outcomes and results. As the frequency and intensity of risk taking increases, risk taking may no longer serve as part of the normal development process and becomes problematic. Even though the Causal Model was designed to explain adolescent behaviors, we cannot overestimate the maturation level of the college athlete (developmental, cognitive and social). The collegiate athlete remains strictly defined as an adolescent, despite sitting on the cusp of adult life. Consequently, it is important to include this model since most define adolescence as the period before adulthood and college students have most recently in the literature been described as "emerging adults." This stance is validated on at least one level with the finding that health related risk taking behaviors initiated in high school are often continued during the college years (Wiley & James, 1997).

Biological Model for Sensation-Seeking

The Biological Model for Sensation-Seeking was developed by Zuckerman (1979; see figure 2) who defined sensation-seeking as "the need for varied, novel and complex sensations and experiences, and the willingness to take physical and social risks for the sake of such experience" [pg. 10]. The first part of the definition refers to the intrinsic rewards (meaningful stimuli) and the second part refers to the risk-taking characteristics of sensation seekers. The sensation seeker does not necessarily seek risk

for the sake of risk. The assumption of a biological basis for the trait of sensation-seeking rests upon many types of evidence, focusing on the relationships between sensation-seeking and its presumed biological substrates (Zuckerman, 1979; 1984). There are links between the degree of sensation-seeking and levels of some of the monoamine neurotransmitters, as evidenced by correlations with levels of noradrenergic enzymes monoamine oxide and dopamine-beta-hydroxylase as well as a relationship to levels of the neurotransmitter norepinepherine in the cerebrospinal fluid (Zuckerman, 1984; 1987). Daitzman & Zuckerman (1980) also found a relationship between the sensation-seeking trait and levels of the circulating gonadal hormones testosterone and estrogen.

Figure 2
Sensation-Seeking Model (Zuckerman, 1988)



Zuckerman argued in 1969 that risk taking is the result of a complex psycho-social phenomenon that is mediated by interplay between socio-environmental factors and cognition. According to that initial theory, a theory of sensory deprivation, those that Zuckerman described as high sensation seekers, perceive less risk in many activities even when the perceived risks are equal. Moreover, these high sensation seekers are more likely to anticipate more positive potential outcomes. The foundation of the 1969 model was a construct labeled "optimal level of stimulation." This personality construct consists of four dimensions: (1) thrill and adventure seeking, (2) experience seeking, (3) disinhibition and (4) boredom susceptibility (Zuckerman, 1971). Risk taking can be considered a subset of sensation seeking because one of the principle reasons for engaging in risky behavior is the excitement of doing so (Pfefferbaum & Wood, 1994). Many behaviors are considered sensation-seeking, based on their common outcome of heightened physiological arousal and psychological excitement. Risk taking behaviors are often grouped into three categories: (1) legal, which include activities such as rock climbing, sky diving or having consensual sexual intercourse (without protection), (2) illegal, but often tolerated by societal values, behaviors such as drag racing and underage experimentation with alcohol would fall into this category and (3) illegal and condemned by much of society, these include vandalism and assault. In other words, high sensation seekers are more likely than low sensation seekers to engage in risky behaviors. After engaging in the activity, high sensation seekers are less likely to label them as risky and try to repeat a wide variety of such behaviors. Not all who are considered high sensation seekers choose the illegal risk-taking route. There are high sensation seekers who choose to fulfill that need for stimulation by choosing more non-risky alternatives such as their occupation, media, art, music, travel and sport.

Zuckerman (1979) originally proposed that sensation seeking would be expected to increase from childhood into adolescence and to decline thereafter. The developmental hypothesis that sensation declines into adulthood has been supported, with studies suggesting that scores are highest in the late teens or twenties (Joinson & Nettle, 2005; Zuckerman, 1994).

Social Norms Theory

Webster (2010) defines a norm as a principle of action binding upon the members of a group and serving to guide control or regulate behavior. Group norms that are reflected in the dominant or most typical attitudes, expectations and behaviors not only characterize these groups but also regulate group members' actions to perpetuate the collective norm (Perkins, 2002). These norms can be powerful and may help to control aspects of behavior. However, the course of behavior most commonly taken is typically in accordance to one's reference group or groups that are of most importance to the individual. For example, Lo (1995) reported that peer norms were a stronger predictor of level of intoxication than were parental norms in first year college students.

The social norms theory (Perkins & Berkowitz, 1986) describes situations in which individuals incorrectly perceive the attitudes and/or behaviors of peers and other community members to be different from their own when in fact they are not. The phenomenon has been called "pluralistic ignorance" (Miller & McFarland, 1991). These misperceptions occur in relation to problem or risk behaviors (which are usually overestimated). This pattern has been well documented for alcohol, smoking, illegal drug use and a variety of other health behaviors and attitudes. Social norms theory predicts

that interventions to correct misperceptions by revealing the actual, healthier norm will have beneficial effects on most individuals.

Researchers have conducted a number of studies, primarily involving alcohol consumption, that supports the core tenets of social norms theory (Perkins & Wechsler, 1996; Larimer, Irvine, Kilmer & Marlatt, 1997; Perkins et al., 1999; Baer & Carney, 1993; Baer, Stacy & Larimer, 1991). These researchers have also found that this tendency to overestimate peer norms exists regardless of gender, ethnic group, residential housing type and fraternity or sorority affiliation.

Statement of Purpose

The purpose of this study is five fold: (1) to assess the frequency of health risk-taking behaviors of NAIA collegiate athletes (2) to determine if there are differences between those athletes who participate in contact sports (football, soccer) versus those sports that are considered no contact (baseball, softball, volleyball) (3) to determine if differences exist between genders (4) to establish the presence of sensation-seeking in those who take part in higher levels of health risk-taking behaviors and (5) to determine if athletes perceive differences in their risk taking when compared to other athletes or teammates and the general college population. Identification of high-risk individuals or groups and the presence of sensation-seeking traits and normative influences can be effective tools in the creation and incorporation of prevention and educational efforts by administrators (Anderson & Milgram, 2001; Wechsler et al., 2000).

Research Questions

1. Are there differences in health risk-taking behaviors between athletes involved in contact/collision sports versus non-contact sports and do these difference exist between genders?

2. Are there differences in sensation-seeking behaviors between athletes who are involved in contact/collision sports versus non-contact sports and do these differences exist between genders?

3. When comparing in-season and off-season, do high sensation seeking athletes take part in health risk taking behaviors more than their low sensation seeking counterparts?

4. Do the athletes perceive differences in their risk-taking behaviors (drinking, marijuana use, risky sexual behavior and gambling) when compared to (a) others on their team or on other athletic teams and (b) non-athletes or general college population?

Definition of Terms

The following terms and definitions were used in this study:

Biopsychosocial processes: Processes, which are a result of an interaction of biological, social, environmental and behavioral factors (Irwin & Millstein, 1992, p. 8).

Boredom susceptibility: An aversion to situations with little variety in stimulation or predictable and "boring" persons, and a tendency to become restless when confined or trapped (Zuckerman, 1991, p. 144).

Complex situations: A set of related feelings, ideas or impulses that may be repressed but continues to influence thoughts and behavior (Zuckerman, 1979a, p, 10).

Contact/Collision sport: Sport such as football, hockey or boxing that involves physical contact between players as a part of normal play (American Academy of Pediatrics, 2001).

Disinhibition: Seeking sensations through social and sexual variety, parties, drinking, and a generally hedonistic life style (Zuckerman, 1991, pg. 144).

Experience seeking: Desire to seek out new experiences through the mind and the senses, through travel and generally through leading an unconventional life style with unconventional friends (Zuckerman, 1991, p. 144).

Health risk taking behaviors: Those behaviors, which are volitional and can have harmful outcomes to ones' health (Irwin & Millstein, 1992, p. 7).

Norms: Rules that groups use for appropriate and inappropriate values, beliefs, attitudes and behaviors. These rules may be implicit or explicit (Perkins & Berkowitz, 1986).

Novel sensations: Sensations that are new and different, often in an interesting, unusual or inventive way (Zuckerman, 1979a, p. 10).

Sensation-seeking trait: A trait defined by the need for varied, novel and complex sensations and experiences and willingness to take physical and social risks for the sake of such experiences (Zuckerman, 1979a, p. 10).

Thrill & adventure seeking: Desire to engage in physically risky activities involving novel sensations and experiences, such as parachute jumping or scuba diving (Zuckerman, 1991, p.144).

Delimitations

This study took take place at various NAIA affiliated Colleges and Universities in Eastern Missouri and Southern Illinois and will only include student-athletes ages 18-25 years of age. There were a number of limitations to this study. First, the student-athletes were from various locations throughout the United States therefore the possibility of cultural differences could exist. Secondly, some student-athletes may be undergraduates while others may be graduate students depending upon year of eligibility. Thus the age differences between student-athletes may have been a factor in the results. Thirdly, the NCAA records (there are no comparative records kept by the NAIA) indicate that about 83% of all student-athletes are White (Caucasian) creating an imbalance of racial and ethnic representation. Fourth, this was a cross-sectional study without longitudinal data, and cannot represent how the risk-taking behaviors change over time (in season, out of season), individual program success and student-athlete maturity. Finally, all participants are student-athletes so this study will only apply to this population.

Significance

In order to develop effective prevention and intervention programs for student-athletes concerning health risk-taking behaviors such as alcohol and substance abuse and sexual health, we must first understand the types of behaviors and when these behaviors occur. Perhaps the most important factors that need to be understood are the possibility

that various explanations, such as sensation seeking trait and social norms theory may play a central role in such behaviors. It is often the responsibility of the intercollegiate athletic governing bodies, as well as the individual institutions, to provide such programming for prevention and intervention. Therefore, if the influences of risk-taking are understood more fully, those that create such programs are more empowered to (1) develop more effective training and education programs and (2) develop and present tactics/strategies to guide the student-athlete in making better choices when it comes to these health risk-taking behaviors.

Summary

Athlete involvement in maladaptive lifestyles and risk-taking behaviors is receiving increased media attention. The reasons for these self-destructive behaviors are unclear and remain a critical concern for any institution. There are questions as to whether risk-taking behaviors stem from the unique social and academic environment experienced by intercollegiate athletes or due to other factors such as sensation-seeking personality traits, social ecological influences or other biopsychosocial factors associated with maturation or just the "normal" college experience of experimentation. Previous research on student-athletes and health risk-taking behaviors have focused on certain behaviors (alcohol & substance abuse) and has rarely investigated sexual risk-taking or those factors associated with maturation and personality that may help explain why some choose to take risk while others do not. This study will attempt to consider these factors.

CHAPTER 2

Review of the Literature

Introduction

The NAIA (National Association of Intercollegiate Athletics) is an intercollegiate governing body that began as the NAIB (National Association of Intercollegiate Basketball) in 1940 and became the NAIA in 1952 (see table 1).

Table 1

NAIA vs. NCAA comparison

	NCAA	NAIA*
Name	National Collegiate Athletic Association	National Association of Intercollegiate Athletics
Recruitment of athlete differences	Strict recruiting guidelines	Recruiting guidelines not as strict
Divisions/Participants	3 divisions (I, II & III)/385,000	2 Divisions (I & II in Basketball only)/~50,000
Organizational policy	Hold institutions accountable in many aspects of athletic programs	More institutional autonomy
Number of Institutions	Over 1000 member institutions (in all divisions)	300 member colleges & universities (in US & Canada)
Scholarship offerings	Divisions I & II offer scholarships in varying levels	~90% offer some type of scholarship
Education & programs	There are various optional programs offered to member institutions. Substance abuse testing is done throughout the year for all sports and is expected to be conducted by individual institutions regularly.	Member institutions must make commitment to "Champions of Character" program. Substance abuse is only discussed in terms of education & campus policies.
Core purpose of organization	Core purpose is to govern competition in a fair, safe, equitable & sportsmanlike manner & to integrate intercollegiate athletics into higher education so that education is paramount.	Core purpose is to promote education & development of students through intercollegiate sports.
Reports	Health Risk-Taking Behavior survey administered every 5 years.	No organizational surveys administered. Individual institutions would administer all information or surveys.

*Data on total # of student-athletes and breakdown by race/gender unavailable.

The NAIA prides itself on embracing the concept of the student and recognizes the importance of the individuality of each member institution. In a statement emailed to

me by the Director of Public Relations & Communications for the NAIA (November 2008) it states "The NAIA does not articulate for its member institutions a specific risk behavior management policy or approach. We rely on our member institutions and conferences to arrive at specific policies and strategies, consistent with their own circumstances and needs." In the NAIA's organizational policy manual (2009-2010) they include the following statement under Athletic Training: "while maintaining institutional autonomy and individual institutional control, the NAIA is committed to establishing and monitoring requirements which will have a positive impact upon the substance abuse problem as it relies to athletics and, more specifically, to student-athletes." Compare this to the NCAA, who has it's own Health & Safety division which "offers programs and other resources for its members to develop policy and practices that help student-athletes make proper choices for healthy lifestyles." The NCAA also has a research division that performs a membership wide survey on student-athlete health risk-taking behaviors (substance use/abuse & gambling) every 5 years.

So while we read and hear about student-athletes and their "nefarious" risk-taking behaviors, most likely these student-athletes are members of an NCAA institution, by nature of their higher visibility, and not those from NAIA institutions. However, I suspect that the student-athletes within the NAIA institutions are equally involved in health risk-taking behaviors and the negative consequences that are associated with many of those behaviors.

The College Athlete

Collegiate athletes play a unique role as representatives of their institutions. Their social status, public appearances and discipline are all predicated on their involvement in athletics (Hill, Burch-Ragan & Yates, 2001). With athletes and athletic programs

representing key dimensions of college life, it is expected that the behaviors of athletes reflect the social standards that colleges wish to uphold. On the other hand, being a college athlete presents a number of unique challenges. To date, research has been organized into six areas of challenge: (1) balancing athletics and academics (Lanning, 1982), (2) adapting to social challenges associated with student-athlete status (Lanning 1982), (3) managing athletic success and failures (Cavenar & Werman, 1981), (4) minimizing physical injury (Rotella & Heyman, 1986), (5) terminating their athletic career (Pinkerton, Hinz & Barrow, 1989) and (6) weight management (Swoap & Murphy, 1995). Many researchers suggest the aforementioned challenges are indeed responsible for why student-athletes experience higher rates of health risk-taking behaviors compared to university averages.

The structural and routine requirements (physical & mental) as well as the expectations placed on these individuals result in a unique type of socialization of attitudes and behaviors among participants. These attitudes and behaviors can either be positive or negative. Of particular concern are attitudes and behaviors of athletes with regard to health risk-taking behavior. While it is important that the student-athlete represent their institution and sport with personal integrity, the overall health and well-being of the student-athlete are equally important. An evaluation of student-athletes and insight into their behaviors provide the impetus for this research. The health risk-taking patterns among intercollegiate student-athletes have been a long-standing concern among coaches, athletic trainers, physicians and administrators (Shirazi & Tricker, 2005). Information gained from this and other research like it has the potential to be helpful in designing risk reduction educational programming for student-athletes.

There is often an "intuitive" assumption that athletes are more likely to embody a "clean-living" approach when compared with that of their non-athlete counterparts. The

athlete is perceived as someone who appreciates the need to maintain a healthy body and thus practices good health habits. In our society, athletes are presented as role models of supremely healthy and fit individuals. That image is reinforced by the intercollegiate governing bodies policies on random drug testing among student-athletes. However, this stereotype is often at odds with reality. An accumulating body of evidence indicates that college student-athletes are more likely to engage in some form of risky behavior, particularly binge drinking, that is detrimental to health when compared university wide (Leichliter et al., 1998; Nattiv & Puffer, 1991; Selby et al., 1990; Wechsler et al., 1998; Nelson & Wechsler, 2001; Martens et al., 2006).

College athletes vs. Non-athletic peers

Several studies assessing a broad range of health risk-taking in athletes have concluded that athletes (Nattiv & Puffer, 1991; Overman & Terry, 1991; Wechsler et al., 1997; Leichleter et al., 1998) may be at higher risk for certain maladaptive lifestyle behaviors than their non-athletic peers, especially those behaviors related to alcohol abuse, having more sex partners, contracting more sexually transmitted diseases, and motor vehicle safety. Certain maladaptive lifestyle behaviors may be related to participation in specific sports.

In a study by Nattiv et al. (1997) athletes had a significantly greater proportion of "high risk" life-style behaviors over the previous 12 months when compared with non-athlete controls in a number of areas such as alcohol consumption (quantity & frequency) and sexual behaviors. In another study by Nelson and Wechsler (2001) athletes were found to be more likely than non-athletic peers to engage in binge drinking. Those findings suggested that athletes are more likely than their non-athlete counterparts to be surrounded by a social environment that is associated with binge drinking. Kueffler et al.

(2005) showed that athletes and non-athletes differed in drinking habits. Athletes were more likely to drink twice per week, while the non-athletes only drank once per month over a 12-month period. Kuo et al. (2002) reported that 37% of Canadian undergraduate students drank on a weekly basis and the 2006 NCAA drug and alcohol survey showed that 65% of the student-athletes surveyed reported consuming alcohol two or fewer times per week (NCAA Research Staff, 2006). Few studies have compared athletes and non-athletes with respect to illicit drug use and the collective findings are inconclusive. For example, Selby et al. (1990) reported that athletes had higher levels of marijuana use, but Wechsler et al. (1997) found that athletes had lower levels of marijuana use. Several studies addressing sexual behaviors in athletes when compared to non-athletes (Benedict, 1998; Exkenazi, 1990; Fritner & Rubinson, 1993; Hoffman, 1986; Jackson, 1991 and Koss & Gaines, 1993) have suggested that male athletes are more sexually active and involved in higher number of sexually abusive behaviors.

Supporters of athletes and athletes themselves argue that risk taking athletes are "singled out" or overly examined due to their notoriety or social status on campus. It has also been mentioned that athletes are more likely to be falsely scrutinized or accused, when in reality no real differences exist in athlete's behaviors relative to non-athletes (general college population). The purpose of this study is to look across a gambit of health risk-taking behaviors that appear prominent in the various levels of collegiate athletics. Once identified and understood, informational programs and tools can be developed to facilitate recognition, prevention and rehabilitation if warranted.

College Athletes and Alcohol

Alcohol misuse/abuse is a risk factor for increased morbidity and mortality in high school and college students (Morbidity and Mortality Weekly Report, 2008). National studies have found that intercollegiate athletes consumed more alcohol, engaged in more frequent heavy episodic drinking (defined as having four or five drinks in one sitting), and experienced more negative alcohol-related consequences as compared with non-athletes (Leichliter et al., 1998; Wechsler et al., 1997; Nelson & Wechsler, 2001; Nattiv & Puffer, 1991, 1997). In the latest NCAA survey (2006) approximately 80% of intercollegiate (Div. I, II & III) athletes reported using alcohol in the past 12 months and of those 60% believe that their use of alcoholic beverages has not had an effect on athletic performance or on their general health. Conversely, almost one-third (31%) of student-athletes stated that one or more times they performed poorly in practice or a game due to drinking. No such data exists at the NAIA level.

Wechsler et al. (1997) and Nelson and Wechsler (2001) compared frequency of heavy episodic drinking (having five or more drinks per sitting for males and four or more per sitting for females) between intercollegiate athletes and their non-athlete peers. Wechsler et al. (1997) found that a greater percentage of both male and female athletes reported heavy episodic drinking than the non-athlete group (61% vs. 43% for males and 50% vs. 36% for females) and frequent heavy episodic drinking (three or more heavy drinking episodes; 29% vs. 18% for males and 24% vs. 15% for females) in the two weeks preceding their participation in the studies.

Leichliter et al., (1998) sampled 51,483 college students from 125 US universities and colleges, of whom 8,749 were intercollegiate athletes. They found that intercollegiate athletes reported consuming more drinks per week as compared to non-athletes, with athletes averaging 7.57 drinks per week and non-athletes averaging 4.12.

Leichliter et al.'s results also revealed a greater percentage of athletes than non-athletes reported heavy episodic drinking (55.3% vs. 36.3%) in the two weeks prior to their participation in the study.

Frequency of drinking, or number of drinks per sitting, is strongly related to experiencing negative alcohol-related consequences (Nelson & Wechsler, 2001; Wechsler et al., 2000). Two of the aforementioned studies (Leichliter et al., 1998; Nelson & Wechsler, 2001) also collected data on negative consequences associated with alcohol use. Those negative consequences include such realities as regretting one's actions, being hurt or injured and sexually taking advantage of someone else. The results were relatively consistent among males and females, the exception being that males more commonly took sexual advantage of someone else. Nelson and Wechsler (2001) examined negative consequences that were related specifically to alcohol and found that intercollegiate athletes were more likely than non-athletes to experience 16 of 18 possible consequences, including getting into trouble with the police (10.6% vs. 5.8%), having unplanned sexual activity (31% vs. 22.7%), and doing something later regretted (46.4% vs. 37.2%). While I choose not to inquire about negative consequences in this study, I thought it important to discuss the issues in context and why looking at the alcohol use habits of intercollegiate athletes is of utmost importance. When the media exposure highlights illegal or maladaptive behaviors of intercollegiate athletes, the negative consequences are the issue or focus of the report.

Another area of concern is alcohol consumption as a function of sports involvement. In other words, does the sporting environment/culture encourage such behaviors? Two studies (Leichliter et al. 1998; Hildebrand et al., 2001) found that as one's involvement or investment in sport increases so does their alcohol consumption. Leichliter et al. (1998) divided their sample of athletes into those involved with

intercollegiate athletics in positions of leadership (team captains) and those not involved in leadership positions. They found that athletes in positions of leadership reported having more drinks per week (8.25 vs. 7.34) and were more likely to engage in heavy episodic drinking (58% vs. 54.4%) as compared to those athletes that were not in leadership roles. Hildebrand et al. (2001) using a sample of 1,287 students from one university and divided their sample into three groups: those who participated in intercollegiate athletics, those who participated in athletics in high school but not college and those who did not participate in athletics either in high school or college. Their results indicated that as level of athletic involvement increased (from never to college) the percentage of individuals classified as heavy drinkers increased from 13.8% to 28.5% respectively. More than half of the college athletes (53%) reported at least a few heavy drinking episodes per month, as compared to 49.1% of the students who had participated in sports in high school and 31.7% of the individuals who had never participated in sports.

Five studies (Bower & Martin, 1999; Martin, 1998; NCAA, 2006; Selby et al., 1990; Thombs, 2000) examined the relationship between seasonal status (in season or out of competitive season) and alcohol consumption among intercollegiate athletes. All of those studies showed that alcohol consumption was lower during the athletes' competitive seasons. For example, in the largest study (NCAA, 2006), 59.4% of the sample indicated that they drank less during the competitive season. These studies all assessed this question via questionnaire at a single point in time and not longitudinally nor did they look at the sports with a spring and a fall season of competition and the differences within those seasons.

Alcohol consumption among college athletes could be a factor of the sport (such as type and level of competition). Research in this area is sparse. The most recent

NCAA (2006) study compared 12-month prevalence rates of alcohol use by level (Div. 1, II & III) and sport type. Overall, a slightly greater percentage of Division III athletes reported using alcohol at least once in the past year (82.1%), followed by Division I (78.3%) and Division II (77.7%). This study also found sport-type differences in alcohol use over the past year, women's swimming and diving (88.1%), women's soccer (86.9%), softball (85.3%), men's swimming and diving (84.7%) and baseball (83.4%), and lower prevalence rates from men's track and field (68.8%), women's track and field (71.3%), women's basketball (71.5%) and men's basketball (74.1%). Of course the only measure in this study was drinking alcohol in the past year, a very broad variable. Martens et al. (in press) focused on intercollegiate athletes from two Division I universities and assessed for sport type differences on more precise alcohol quantity-frequency measures and found sport-type differences on heavy episodic drinking over the 2 weeks prior to completing the survey, average drinks per week, and drinking over the past month prior to completing the survey. Kueffler et al., (2005) also found significant differences in the alcohol usage between sport teams. There was a difference in the usage rates over the past 12 months. This study showed that wrestling had a significantly higher usage rate when compared to volleyball, softball and track. Nattiv, Puffer & Green (1997) separated Division I athletes according to contact (football, basketball, soccer) and non-contact (tennis, golf, volleyball, track) sports and found that athletes in contact sports had a greater quantity and frequency of alcohol consumption than did those in non-contact sports.

College Athletes and Marijuana/Substance Use

Few researchers (Selby et al., 1990; Wechsler et al., 1997) have compared athletes to non-athletes with regard to illicit drug use and findings are inconclusive. The NCAA

conducts *The Study of Substance Use Habits of College Student-Athletes Survey* every 5 years and according to the latest results (2006) usage of marijuana and psychedelics is down from previous studies. However, amphetamine usage continued to increase across all Divisions (I, II & III) and especially in men's sports, with basketball, football & swimming being among the highest. The vast majority of student-athletes who reported marijuana use during the past 12 months used it only one or two times or "occasionally," which is a decrease from the 1997 report. Almost half of the student-athletes who continue to use marijuana and/or amphetamines reported they had used it ten or more times in the 12 months prior to completing the survey.

Marijuana is the most commonly used illicit drug among college students, as up to 30% of undergraduate students report marijuana use in the past 12 months, and between 16-22% report use in the last month (CORE Institute, 2001). Consistent with prevalence estimates among college students in general, results of a national study of intercollegiate athletes indicated 28.4% of athletes used marijuana in the past year, second only to alcohol use (Green et al., 2001). Labrie et al. (2009) found that 36.8% of a sample of 522 athletes reported using marijuana at least one time in the past 12 months prior to the survey. Grossbard et al. (2009) reported 36% of athletes reported to using marijuana at least one time in the past 12 months prior to the survey. An interesting finding in the study by Grossbard et al. (2009) suggested that marijuana use by males was negatively associated with team attraction (attraction to one's salient group) possibly suggesting that marijuana use among athletes may occur outside of the social network of one's athletic team. Further, athletes reporting marijuana use were more likely to engage in heavy episodic drinking than athletes who did not report marijuana use (Wechsler et al., 1997). Problematic marijuana use is associated with psychological and physical consequences

(Simons & Carey, 2006). Even short term use can have potentially debilitating and residual effects, particularly for student-athletes.

College Athletes and Sexual Activity

Unprotected sexual activity places athletes at risk for HIV and other sexually transmitted diseases (STDs), as well as unplanned pregnancies that can compromise student-athlete academic and athletic success and may result in potentially life-altering consequences. More HIV infections occurred in young people ages 13-29 (34%) than any other age group (CDC, 2008). The rates for chlamydia, gonorrhea and syphilis are highest in the group 15-24 years old (almost half of the 19 million new cases each year) for both men and women (CDC, 2006). Studies show that athletes were more likely to engage in a variety of sexual risk-taking behaviors, including less frequent use of contraception, greater number of sexual partners, and an increased frequency of STDs (Faurie et al., 2004; Nattiv & Puffer, 1991; Kokotalio et al., 1996; Nattiv & Puffer, 1997).

Nattiv & Puffer (1991) found that athletes were less likely to use contraception than their non-athletic peers (40% vs. 26%), athletes were also more likely to report increased frequency of STDs than their non-athletic peers (11.6% vs. 2.8%) and to have an increased number of sexual partners (28% athletes vs. 12.7% non-athletes). In a study by Chandler et al., (1999) athletes reported being more sexually active (ranging from very active to barely active) than non-athletes (89% to 79%). Huang et al. (2007) found that of those athletes reporting unprotected sexual activity differences were found between male athletes (43.4%) and female athletes (34%).

One behavioral factor that could account for differences in sexual behavior based on athlete status is alcohol use, which is among the most frequently cited contributors to

sexual risk behavior among adolescents and young adults (Cooper 1992, 2002; Donovan & MacEwan, 1995; Weinhardt & Carey, 2000). Moreover, findings from experimental research generally support a causal influence of intoxication on sexual risk-related outcomes (George & Stoner, 2000; Maisto et al., 2002). In a national sample of more than 17,000 college students Wechsler (1992) reported that "binge" drinkers were 7-10 times more likely than "non-binge" drinkers to engage in unplanned and unprotected sexual activity.

College Athletes and Gambling

Gambling has been shown to be strongly associated with a host of other risk-taking problem behaviors, including alcohol abuse, illicit drug use and unsafe sex (Engwall, Hunter & Steinberg, 2004). Since many studies have shown that student-athletes are consuming alcohol at higher rates than their non-athlete peers it is the assumption that they are also at risk for higher rates of gambling. Few studies have been conducted among college student-athletes. In a recent study utilizing a small sample of college students, results revealed significantly greater problem gambling rates in athletes than non-athletes (Engwall, Hunter & Steinberg, 2004). The National Collegiate Athletic Association (1996) conducted a self-report study on infractions and found that 25.5% of Division I men's basketball and football student-athletes indicated they had gambled money on other collegiate sporting events and 3.7% had wagered on a game in which they played. A study by Huang et al. (2007) found that past year prevalence of gambling and sports wagering was higher among male student-athletes than among their female counterparts. The highest form of gambling behavior in this study was playing cards or board games for money. This study also found a significant upward linear relationship between gambling severity and the mean number of drug/alcohol-related problems

experienced by college student-athletes. It has also been suggested that student-athletes are at an increased risk for gambling problems because of their competitive nature fostered in their social environment and also that those in the "higher profile" sports are more at risk (Curry & Jiobu, 1995). Gupta, Derevensky & Ellenbogen (2006) found that certain personality types (e.g. sensation seekers) are more likely to develop gambling problems and Cross et al. (1998) discovered that student-athletes who engage in sports wagering were also more likely to be risk-takers.

Athletes and Sensation Seeking

Zuckerman (1994) suggested that high sensation seekers participated in sports at a higher rate than low sensation seekers. Other studies suggest a link between sensation seeking personalities and the health risk-taking behaviors of athletes (Hartman & Rawson, 1992; Schroth, 1995) these studies also found athletes to have a higher sensation seeking propensity than non-athletes. However, the manner in which sensation seeking impacts alcohol use among student-athletes has not been specifically explored.

Many have tried to equate those that participate in body-contact or collision type sports to sensation seeking behaviors. It has been suggested that these sensation seekers are interested in the risk that sports provide. Straub (1986) found that high-risk sport participants scored significantly higher than low-risk sports athletes on the boredom susceptibility subscales but did not show any significance in the other scales (disinhibition & thrill/adventure seeking). Thuen (1994) examined risk-seeking behaviors versus safety-seeking behaviors among Norwegian adolescents to determine their relationship to injury related behaviors. Sensation seeking scores were negatively correlated with safety-seeking and positively correlated with risk-taking. The thrill and adventure seeking subscale was the strongest predictor of risk-seeking. Jack and Ronan

(1998) compared various sporting activities and the levels of sensation seeking (high vs. low) and found that sports such as running and golf rate among those classified as low sensation seekers, whereas swimmers rated middle to high in sensation seeking. O'Sullivan et al. (1998) compared contact (football, field hockey, lacrosse) to non-contact sports (baseball & equestrian) and found higher levels of sensation seeking in those involved in the contact sports. As mentioned in the previous chapter not all who are considered high sensation seekers participate in the riskiest of behaviors. In fact, sports are considered a non-risky or socially acceptable expression of sensation seeking. Sport provides a modality for individuals to obtain increased levels or arousal. However, the problem arises when the sport does not provide the necessary stimulation and the individual chooses to seek a means of arousal that may involve health risk-taking behavior such as driving under the influence of alcohol or riding with someone who is under the influence, alcohol or substance use/abuse, high risk sexual activity and gambling. High sensation seekers tend to see many situations as less risky than do low sensation seekers (Zuckerman, 1979b; Wetherill & Fromme, 2007). "Even when both appraise the risk level to be the same degree, the high sensation seekers anticipate positive feelings and sensation, while low sensation seekers anticipate anxiety" (Zuckerman, 1991, p. 148).

Sensation seeking and invulnerability have both often been discussed as contributing factors to college student risk behavior, little research has focused on the relationship between the two constructs. Some authors have offered speculation that they work in conjunction (Arnett, 1992). Several possible relationships may exist between sensation seeking and danger invulnerability as predictors of risk taking. One possibility is that danger invulnerability and sensation seeking explain much of the same variability in risk-taking behaviors. The second possibility is that invulnerability and sensation

seeking play unique roles as behavioral predictors, whereby sensation seeking predisposes individuals to overlook dangers of hazardous behaviors (Ravert et al., 2009). Sensation seeking and danger invulnerability were both found to make unique contributions to students' health compromising behaviors in a study by Ravert et al. (2009).

Perceived Norms

Health behaviors are guided not only by individuals' own attitudes (Ajzen & Fishbein, 1980), perceived abilities (Bandura, 1977, 1986), barriers (Janz & Becker, 1984; Rogers 1975) and risk assessments (Weinstein, 1989; Weinstein & Nicolich, 1993), but also by their perceptions about others beliefs (Ajzen & Fishbein, 1980) and behaviors (Asch, 1951; Deutsch & Gerard, 1955). Commonly referred to as subjective norms (Ajzen & Fishbein, 1980; Fishbein & Azjen, 1975) or social norms (Perkins & Berkowitz, 1986; Perkins et al., 1999) *perceived norms* are conceptualized as comprising two interrelated ideas: (1) individuals' perceptions about the prevalence of a behavior (description norms) and (2) pressures individuals experience to conform (injunctive norms). The greater the perceived prevalence of a behavior, the greater the likelihood that individuals will believe that engaging in behavior is within the prevailing norms of conduct.

Most research has found that by late adolescence, as well as traditional aged college students (Lo, 1995; Perkins 1985), peers are typically the strongest influence of personal behavior, especially with regard to alcohol and substance use (Kandel, 1980, 1985). Furthermore, peer norms may be of particular importance in "peer intensive" college contexts, for example, fraternity/sorority or athletic communities. Research highlights the importance of examining group and gender-specific influences among

closely connected at-risk groups, because misperceptions of proximal reference groups are more likely to influence drinking behavior than misperceptions of distal reference groups (Borsari & Carey, 2003; Korcuska & Thombs, 2003; Lewis & Neighbors, 2006).

Students' overestimation of perceived substance use has been found to be among the best predictors of alcohol use (Neighbors et al., 2007) and marijuana use (Kilmer et al., 2006; Neighbors, Geisner & Lee, 2008). According to Perkins (1994), social norms produce a strong desire in individuals to drink in accordance with their peers' drinking behavior, or at least perceptions of their peers' drinking behavior. Previous studies have demonstrated that most young people tend to overestimate their prevalence of drinking in their peers (Baer, Stacy & Larimer, 1991). Normative beliefs about peer drinking have consistently been found to be related to alcohol use among college students. College students tend to overestimate the amount (Perkins, Haines & Rice, 2005; Yanovitzky, Stewart & Lederman, 2006) and frequency (Perkins et al., 1999) of alcohol typically consumed by their peers. College student athletes similarly tend to view their fellow student-athletes, as well as non-athlete peers, as drinking more than themselves (Martens et al., 2006; Thombs, 2000).

Martens et al. (2006) looked at differences between actual and perceived student norms in alcohol use, drug use and sexual behavior and found that students overestimated consumption patterns for the typical student when compared to actual behavior across all risk categories. Athlete specific normative misperceptions or overestimations predicting alcohol and marijuana use have also been identified. Athletes tend to hold misperceptions of typical use by fellow athletes at their school (Perkins & Craig, 2006) and perceived drinking among athletes friends may associated with personal alcohol consumption among male and female athletes (Martens, et al., 2006). Hummer, LaBrie and Lac (2008) demonstrated that perception of normative drinking behavior was the best

predictor of actual consumption, after controlling for other previously established predictors of alcohol use among athletes. Perceptions of athletes' marijuana use norms have also been shown to predict individuals' own use among male athletes (LaBrie, Grossbard & Hummer, 2009), while opposite sex marijuana use norms may affect female athletes' decisions to use marijuana (Page & Roland, 2004).

Research conducted by Grossbard et al., (2009) sought to expand current research on intercollegiate athlete substance abuse prevention by examining the role that attraction to team (team identity) as a contributing factor in the relationship between perceived substance use norms and actual behaviors. Findings were consistent with previous research, providing further evidence that male and female athletes overestimate the substance use of other athletes at their school. This tendency to overestimate the extent of peers' drinking behavior may make those drinking heavily less likely to view their drinking as problematic but, rather, as normal and therefore acceptable behavior.

Sport type too may play a role in team connectedness, therefore team sports may strengthen the influence of attraction to team and perceived norms on personal alcohol and marijuana use, as opposed to more individualized sports (Martens, Watson & Beck, 2006).

Summary

In this chapter the literature pertinent to the study was reviewed. Information from the literature regarding alcohol use, drug use (specifically marijuana), sexual behaviors, gambling, sensation seeking and perceived norms were examined and compared. The information was reviewed concerning both student-athletes and the comparisons to the non-athlete (general) college population. The literature showed areas

of concern for both student-athletes and non-athlete populations. However, for the purposes of this study the student-athlete literature is more relevant.

A majority of diseases, unintentional injury and death in the United States are associated with unhealthy lifestyles. The literature has shown student-athletes to be higher in some health risk-taking behaviors as well as sensation seeking and are often oblivious to the negative consequences and potential dangers associated with such behaviors. These individuals may be at higher risk for alcohol related accidents, sexually transmitted diseases and substance abuse. College student-athletes may be particularly vulnerable to these health concerns due to the unseen pressures of sport participation and in some cases (high sensation seekers) danger invulnerability.

Chapter 3 contains a description of the methods and procedures used for this study. In Chapter 4 the results of the data analysis are presented and discussed. Chapter 5 contains the study summary, including conclusions and future study recommendations.

CHAPTER 3

Methodology

The purpose of this study was to investigate the health risk-taking behaviors (alcohol, drug, sexual and gambling) of NAIA student-athletes. The purpose of this chapter was to describe the methods used to collect data. The chapter is divided into: design, subjects, instrumentation, data collection and analysis of data.

Design

A selected sample of NAIA college student-athletes from three small Midwestern universities were assessed to determine health risk taking behaviors including: out of season & in season alcohol use, marijuana use, sexual activity and gambling, sensation seeking traits and perceived norms were also assessed among the population. Health risk taking behaviors, sensation seeking and perceived norms were also compared by gender and sport type.

Subjects

The sample was selected from three of eleven NAIA universities in Eastern Missouri and Southern Illinois. The schools were selected by using the criteria of being within a one hundred mile radius of St. Louis, Missouri. Approval for the study was obtained from Institutional Review Boards (IRB) from The University of Texas-Austin (Appendix A) and Saint Louis University (Appendix A).

Upon approval of the study, the researcher contacted, by letter (Appendix B), the Athletic Directors from eleven NAIA schools in the Southern Illinois and Eastern Missouri region to gain permission to talk to the head athletic trainers about recruiting subjects for the study in the athletic training rooms. Of those eleven schools, eight gave permission, two schools declined and one school never responded to initial letter or

follow-up Email attempts. Of the eight schools that gave permission, two required me to contact their campus Internal Review Boards and both boards allowed access to student-athlete population after UT IRB documents were submitted. Once permission was given, athletic trainers from the eight schools were contacted via phone or Email to explain study and get permission and available days and times to come to school. Unfortunately, when setting up times to come to campus I was unable to find mutually agreeable times with five of the schools thus only three schools were used to collect data.

Instrumentation

Student-athletes were asked to complete a 73 item questionnaire (Appendix C) that consisted of: 19 questions assessing various health risk taking behaviors such as: drinking (during in & off season), stimulant and marijuana use, sexual and contraceptive practices were taken from the *Lifestyle Assessment for Intercollegiate Athletes* (Nattiv & Puffer, 1991), three questions regarding gambling behaviors taken from *NCAA National Study of Collegiate Sports Wagering and Associated Behaviors* (NCAA, 2003), *Brief Sensation Seeking Scale* (Hoyle, 1999), *Rosenberg Self-Esteem Scale* (Rosenberg, 1965), questions concerning perceived norms and various demographic questions such as sport, age, ethnicity, sex, living situation, scholarship status, number of years being on current athletic team and present playing status. The questionnaire took approximately 10 to 15 minutes to complete.

Questions taken from the *Lifestyle Assessment for Intercollegiate Athletes* (Nattiv & Puffer, 1991) included various constructs associated with alcohol use (in and out of season), use of stimulants and marijuana (in and out of season) and sexual behaviors (STDs, contraceptive use and number of partners). Other questions posed refer to use of various substances to cope and main reasons associated with HRBs. All HRB questions

were asking about behaviors within the past 12 months. Due to the use of the various questions taken from the *Lifestyle Assessment for Intercollegiate Athletes* and not using the entire assessment tool consistency ranged from α=.837 to .154. In some areas, such as sexual activity related questions, the constructs being measured are varied and thus internal consistency was low (α=.154). On the other hand, when measuring like constructs such as alcohol use (α=.837) and gambling (α=.768) the internal consistency was much more acceptable.

The *Brief Sensations Seeking Scale* (Hoyle, 1999) is an 8-item survey that was created by adapting items from the SSS-V (Zuckerman et al., 1978) and a set of items derived from the SSS-V but tailored for adolescents. Each of the four primary dimensions of sensation seeking is represented by two items thus creating an 8-item scale (see Table 2). Responses are indicated on a five point scale: strongly disagree=1, disagree=2, neutral=3, agree=2 and strongly agree=5. Responses to these 8 items had an internal consistency of α=.77.

The *Rosenberg Self-Esteem Scale* (Rosenberg, 1965) is a 10-item Likert scale with items answered on a four point scale, from strongly agree (SA) to strongly disagree (SD). Five of the questions that reflected more negative aspects of self were coded SA=3, A=2, D=1 and SD=0. The other five questions that addressed negative aspects of self were reverse coded as SA=0, A=1, D=2 and SD=3. Responses to this 10-item scale had an internal consistency of α=.85.

The questions concerning perceived norms were developed by the researcher and by utilizing similar ideas used in the literature on perceived social norms and health-risk taking behavior (Kypri & Langley, 2003; Mays et al., 2009; Grossbard et al., 2008; Thombs, Wolcott & Farkash, 1997; Perkins, 2002). Questions included comparing the student-athletes drinking and marijuana use and sexual behaviors to those on their same

team and other teams, as well as comparisons to the non-athlete (general) college student "Do you feel that your teammates or athletes from other teams drink alcohol (smoke marijuana, gamble or engage in risky sexual behavior) more than you do?" or "Do you feel that the non-athletes (or general college population) drink (smoke marijuana, gamble or engage in risky sexual behavior) more than you do?" Internal consistency of the scale was α=.82.

Data Collection

Student-athletes were recruited while visiting the athletic training room at their school during pre-arranged times in the fall of 2009 and spring of 2010. The researcher approached random student-athletes, that were in the athletic training facility at that time, asked if they would be willing to take a 73 question survey (Appendix C). If they consented, the researcher read the recruitment statement (Appendix D) describing the purpose of study and risks/benefits. They were informed that all answers were completely anonymous, no names or other identifying information were required and that information gained would only be used by the investigator for purposes of research and not made available to anyone associated with their school or sport. Once consent was given, the student-athlete was handed an envelope containing the survey, pencil and recording form. After completion of the survey by the student-athlete, they were instructed to return the survey and recording form back into the envelope, seal it and give back to the researcher. Envelopes were not opened until data analysis was run. Eighty-one student-athletes were asked to take the survey and sixty-three (78%) agreed to complete the questionnaire.

Data Analysis

Data collected from each survey was analyzed using frequency counts, independent sample t- tests, Mann-Whitney U and Chi-square with the computer programs from the Statistical Packages for the Social Science (SPSS 13.0).

Frequency data was obtained for each of the dependent variables. The categories for dependent variables included: alcohol use (in and out of season), marijuana use, gambling, and use of contraception, number of sexual partners, sensation seeking and perceived norms. In addition, demographic data was also collected, this included: subjects sport, age, sex, ethnicity, living situation, scholarship status and how long on the team.

Chi-square analysis, Mann-Whitney U (non-parametric), Spearman Rho coefficients and independent samples t-tests were used to compare student-athletes, gender and sport type, on the health risk behavior data collected as well as sensation seeking. The significance level was selected to be .05

Summary

This chapter included information on the methods used to collect data and to examine the health risk taking behaviors, sensation seeking traits and perceived norms of student-athletes. The chapter was divided into five sections: (1) design, (2) subjects, (3) instrumentation, (4) data collection and (5) analysis of data.

In Chapter 4, the results of the data analysis are presented and discussed. Chapter 5 contains a summary of the study, conclusions are presented, implications are made and recommendations for future research are offered.

CHAPTER 4

Results

The purpose of this research study was to describe the health risk taking behaviors, sensation-seeking traits and perceived norms of student-athletes at three NAIA universities and to determine if gender or sport type was related to the health risk taking behaviors and sensation seeking traits of these student-athletes. In this chapter, the results of the study are presented and discussed. Included are the demographics of the respondents and the specific categories of health risk behaviors (alcohol, marijuana, gambling and sexual behaviors). Independent samples t-tests at the .05 significance level were used to compare gender and sport type in health risk taking behaviors. Chi-square, Mann-Whitney U (non-parametric) and Spearman rho correlation analyses at the .05 significance level were used to compare gender and sensation seeking.

Demographics

The results of this chapter were based on data collected from 63 NAIA student-athletes from three universities. Data was not broken down by university, as no comparisons were being made between universities. No questionnaires were dropped from the analysis. Only two subjects had missing data from either sensation seeking or self-esteem, however, all remaining data was intact and able to be analyzed. In regard to this problem, some of the sub-totals do not agree when comparing tables due to this missing data.

The majority of the participants ages ranged from 18-24, (36.5%) of the sample were 18-19, with other ages as follows: 20-21 (39.7%), 22-23 (22.2%) and 24 and older (1.6%). The male to female ratio was (50.8% to 49.2%) respectively. The majority of the participants were Caucasian (77.8%) with other ethnic representations as follows:

Black/African American (9%), Mexican or Latino (4.8%) and other (3.2%). The amounts of time the participants had been a student-athletes at their college are as follows: Less than 1 year (25.4%), 1 full year (12.7%), 2 years (25.4%), 3 years (19%) and 4 years 17.5%. Of the sample 19.0% were on full scholarship, 42.9% were on a three-fourths to one-half scholarship, 19% were on less than half and 19% were walk-ons and not on any scholarship. Sports represented in the sample include: women's soccer (23.8%), baseball (20.6%), softball (19.0%), men's soccer (15.9%), football (12.7%) and volleyball (7.9%), 55.6% were in engaged in contact sports and 44.4% were engaged in non-contact. Of the student-athletes, 44% were living in dormitories 31.7% living with off-campus (not with parents) and students living off-campus (with parents) rounding out the sample with 23.8%. Table 2 provides the complete distribution of student-athletes demographic information.

Table 2
Demographic Frequencies

Variables	N	%
Age		
18-19	23	36.5
20-21	25	39.7
22-23	14	22.2
24 & older	1	1.6
Current Living Situation		
Dormitory	28	44.4
Off-campus (parents)	15	23.8
Off-campus (not with parents)	20	31.7
Years on Team		
<1 year	16	25.4
1 year	8	12.7
2 years	16	25.4
3 years	12	19.0
4 years	11	17.5
Gender		
Male	32	50.8
Female	31	49.2
Ethnicity		
White/Caucasian	49	77.8
Black/African American	9	14.3
Chicano/Mexican/Latino	3	4.8
Other	2	3.2
Scholarship Status		
Full	12	19.0
¾ to ½	27	42.9
Less than ½	12	19.0
None/Walk on	12	19.0
Sport		
Football	8	12.7
Baseball	13	20.6
Softball	12	19.0
Men's Soccer	10	15.9
Women's Soccer	15	23.8
Volleyball	5	7.9
Sport Type		
Contact	35	55.6
Non-contact	28	44.4

Alcohol Use Among Contact and Non-Contact Sports

Several questions were asked concerning frequency and quantity of alcohol use both in and out of season (see Tables 3 and 4). It is interesting to note that during the off-season the contact sport athletes had a tendency to report more alcohol use (i.e. every weekend) and have more drinks per sitting (i.e. 4-5 drinks jumped from 0% to 22.9%). Many also reported not drinking during the season (60%) and in the off-season only (25%) reported not drinking. In comparison the non-contact athletes showed less variability between in-season and off-season.

There were no differences in off-season alcohol frequency of use and quantity when comparing the contact and non-contact groups, however, there were significant differences for in-season alcohol frequency. With reference to in-season alcohol frequency and significant findings ($p<.05$), (60.7%) of non-contact athletes reported using alcohol "a few weekends a month" compared to (31.4%) of the contact sport athletes (see Table 5).

An independent sample t-test was conducted to compare in-season alcohol frequency for contact and non-contact sports. There was a significant difference in scores for contact ($M=.43$, $SD=.608$) and non-contact ($M=.86$, $SD=.891$; $t(61)=-2.264$, $p=.027$). The magnitude of differences in the means was moderate to large (eta squared=.08). With respect to both frequency and quantity of alcohol use this study found more athletes (contact & non-contact) consume more alcohol in the off-season then they do when they are in-season.

Table 3

Alcohol behaviors (frequencies/contact athletes)

Frequency of alcohol use	**In-season %**	**In-season N**	**Off-season %**	**Off-season N**
Never, I do not drink	62.9	22	22.9	8
A few weekends a month	31.4	11	40	14
Every weekend	5.7	2	25.7	9
A few a week & on weekends	0	0	11.4	4
Daily	0	0	0	0
Quantity per sitting				
None, I do not drink	60	21	25.7	9
1-2 drinks	22.9	8	14.3	5
3 drinks	5.7	2	11.4	4
4 -5 drinks	0	0	22.9	8
More than 5 drinks	11.4	4	25.7	9

Table 4

Alcohol behaviors (frequencies/non-contact athletes)

Frequency of alcohol use	**In-season %**	**In-season N**	**Off-season %**	**Off-season N**
Never, I do not drink	32.1	9	14.3	4
A few weekends a month	60.7	17	57.1	16
Every weekend	0	0	7.1	2
A few a week & on weekends	3.6	1	17.9	5
Daily	3.6	1	3.6	1
Quantity per sitting				
None, I do not drink	53.6	15	17.9	5
1-2 drinks	28.6	8	25	7
3 drinks	7.1	2	17.9	5
4 -5 drinks	3.6	1	21.4	6
More than 5 drinks	7.1	2	17.9	5

Table 5

Alcohol behaviors (independent samples t-test/sport type comparison)

Variable	**Contact M**	**Contact SD**	**Contact N**	**Non-Contact M**	**Non-Contact SD**	**Non-Contact N**	***t***
Off-season Alcohol Frequency	1.26	.950	35	1.39	1.07	28	-.534
Off-season Alcohol Quantity	2.09	1.58	35	1.96	1.40	28	.319
In-Season Alcohol Frequency	.43	.608	35	.86	.891	28	-2.26*
In-Season Alcohol Quantity	.80	1.30	35	.82	1.19	28	-.067

*Note. *p<.05*

Alcohol Use among Male and Female Athletes

There were no significant differences when comparing male and female athletes concerning off-season alcohol frequency and quantity or in-season frequency. Both males and females reported less or no drinking during in-season than they did during off-season. Of the student-athletes 50% of males and 48.4% of females reported not drinking in-season as compared to 18.8% and 19.4% respectively in the off-season (see Tables 6 and 7).

However, there was a trend (p=.064) when looking at in-season alcohol quantity between genders (see Table 8). Male athletes were more likely to drink more than 5 drinks at one sitting (15.6%) as compared to females (3.2%).

Table 6
Alcohol behaviors (frequencies/male)

Frequency of alcohol use	**In-season %**	**In-season N**	**Off-season %**	**Off-season N**
Never, I do not drink	50	16	18.8	6
A few weekends a month	40.6	13	50	16
Every weekend	6.3	2	12.5	4
A few a week & on weekends	0	0	15.6	5
Daily	3.1	1	3.1	1
Quantity per sitting				
None, I do not drink	50	16	21.9	7
1-2 drinks	25	8	15.6	5
3 drinks	6.3	2	12.5	4
4 -5 drinks	3.1	1	12.5	4
More than 5 drinks	15.6	5	37.5	12

Table 7

Alcohol behaviors (frequencies/female)

Frequency of Alcohol Use	**In-season %**	**In-season N**	**Off-season %**	**Off-season N**
Never, I do not drink	48.4	15	19.4	6
A few weekend a month	48.4	15	45.2	14
Every weekend	0	0	22.6	7
A few a week & on weekends	3.2	1	12.9	4
Daily	0	0	0	0
Quantity per sitting				
None, I do not drink	64.5	20	22.6	7
1-2 drinks	25.8	8	22.6	7
3 drinks	6.5	2	16.1	5
4-5 drinks	0	0	32.3	10
More than 5 drinks	3.2	1	6.5	2

Table 8

Alcohol behaviors (independent samples t-test/gender comparison)

Variable	**Male M**	**Male SD**	**Male N**	**Female M**	**Female SD**	**Female N**	***t***
Off-season Alcohol Frequency	1.34	1.07	32	1.29	.938	31	.211
Off-Season Alcohol Quantity	2.28	1.63	32	1.77	1.31	31	.507
In-Season Alcohol Frequency	.66	.865	32	.58	.672	31	.076
In-Season Alcohol Quantity	1.09	1.47	32	.52	.890	31	.578

*Note. *p<.05*

Drug Use among Contact and Non-Contact Athletes

Questions were asked relating to drug use, specifically stimulants and marijuana. Use of marijuana in the competitive season and the off-season was also measured. When comparing contact to non-contact athletes there were no significant differences in stimulant frequency of use or use of marijuana during the in or off-seasons.

When comparing frequency distributions between contact and non-contact athletes, 92.9% of non-contact athletes reported not using marijuana during their competitive season but in the off-season only 75% reported not using marijuana (see Tables 9 & 10).

There was a statistically significant difference ($p<.05$) between contact and non-contact athletes reporting overall use of marijuana in the past 12 months. Non-contact athletes were more likely to report overall marijuana use of "more than 20 times" (25%) as compared to the contact athletes (2.9%).

An independent sample t-test was used to compare contact and non-contact athletes in overall frequency of marijuana use in the past 12 months (see Table 11). There was a significant difference in scores for contact ($M=.43$, $SD=.884$) and non-contact sports ($M=1.32$, $SD=1.772$; $t(61)=-2.493$, $p=.017$). The magnitude of differences in the means was moderate to large (eta squared=.09).

Table 9

Marijuana use (frequencies/contact athlete)

Quantity of Marijuana Use per week	**In-season %**	**In-season N**	**Off-season %**	**Off-season N**
Never	94.3	33	91.4	32
1-2 times	2.9	1	5.7	2
3 times	2.9	1	0	0
4-5 times	0	0	0	0
More than 5 times	0	0	2.9	1
Marijuana use in past 12 months	**%**		**N**	
Never	74.3		26	
Once	8.6		3	
3-10 times	14.3		5	
11-20 times	0		0	
More than 20 times	2.9		1	

Table 10

Marijuana use (frequencies/non-contact athlete)

Quantity of Marijuana Use per week	**In-season %**	**In-season N**	**Off-season %**	**Off-season N**
Never	92.9	26	75	21
1-2 times	3.6	1	17.9	5
3 times	0	0	0	0
4-5 times	0	0	3.6	1
More than 5 times	3.6	1	3.6	1
Marijuana Use in the past 12 Months	**%**		**N**	
Never	53.6		15	
Once	3.6		1	
3-10 times	14.3		4	
11-20 times	3.6		1	
More than 20 times	25		7	

Table 11

Drug use behaviors (independent samples t-test/sport type comparison)

Variable	**Contact M**	**Contact SD**	**Contact N**	**Non-Contact M**	**Non-Contact SD**	**Non-Contact N**	***t***
Stimulants	.03	.169	35	.14	.448	28	-1.278
Marijuana use past 12 months	.43	.884	35	1.32	1.722	28	-2.493*
Off-Season Marijuana quantity per week	.17	.707	35	.43	.959	28	-.257
In-Season Marijuana Quantity per week	.09	.373	35	.18	.772	28	-.093

Note. *$p<.05$

Drug Use among Male and Female Athletes

Females in this sample reported using marijuana less in the past 12 months than their male counterparts (71% to 59.4%). However this was not a significant finding when an independent t-test was performed (see Tables 12, 13 & 14).

Table 12
Marijuana use (frequencies/males)

Quantity of Marijuana Use per week	**In-season %**	**In-season N**	**Off-season %**	**Off-season N**
Never	96.9	31	90.6	29
1-2 times	3.1	1	6.3	2
3 times	0	0	0	0
4-5 times	0	0	0	0
More than 5 times	0	0	3.1	1
Marijuana Use in the past 12 Months	**%**		**N**	
Never	59.4		19	
Once	9.4		3	
3-10 times	15.6		5	
11-20 times	0		0	
More than 20 times	15.6		5	

Table 13

Marijuana use (frequencies/females)

Quantity of Marijuana Use per week	**In-season %**	**In-season N**	**Off-season %**	**Off-season N**
Never	90.3	28	77.4	24
1-2 times	3.2	1	16.1	5
3 times	3.2	1	0	0
4-5 times	0	0	3.2	1
More than 5 times	3.2	1	3.2	1
Marijuana Use in the past 12 Months	**%**		**N**	
Never	71		22	
Once	3.2		1	
3-10 times	0		0	
11-20 times	3.6		1	
More than 20 times	9.7		3	

Table 14

Drug use behaviors (independent samples t-test/gender comparison)

Variable	**Male M**	**Male SD**	**Male N**	**Female M**	**Female SD**	**Female N**	***t***
Stimulants	.03	.177	32	.13	.428	31	-1.179
Marijuana use past 12 months	.97	1.47	32	.68	1.30	31	.832
Off-Season Marijuana quantity per week	.19	.738	32	.39	.919	31	-.952
In-Season Marijuana quantity per week	.03	.177	32	.23	.805	31	-1.316

Note. *p<.05

Sexual activity among contact and non-contact athletes

Questions regarding sexual behaviors, such as: number of STDs, number of sexual partners, the practice of safe sex and type of contraception used were included in the survey (see Table 15). There were no significant findings in any of the behaviors when running an independent samples t-test comparing contact and non-contact athletes (see Table 16). Pregnancy was compared using chi-square analysis and there were also no significant findings.

The interesting finding here was that less than 50% reported using contraception "always." I did not expect to find any significant differences between the sport types when looking at sexual behaviors.

Table 15

Sexual behaviors (frequencies/sport-type comparison)

Variable	Contact % (N)	Non-Contact % (N)
Number of STD's		
Yes, 1 time	5.7 (2)	10.7 (3)
More than 1 time	0 (0)	3.6 (1)
Never	91.4 (32)	85.7 (24)
Pregnant (or been involved)		
Yes	11.4 (4)	7.1 (2)
No	85.7 (30)	89.3 (25)
Number of sexual partners (last 12 months)		
Not sexually active	14.3 (5)	10.7 (3)
1 partner	20 (7)	32.1 (9)
2 partners	5.7 (2)	25 (7)
3 partners	8.6 (3)	3.6 (1)
More than 3 partners	51.4 (18)	28.6 (8)
Safe sex practices		
I have become abstinent	8.6 (3)	14.3 (4)
Always use condom	40 (14)	53.6 (15)
Use condom sometimes	28.6 (10)	25 (7)
Monogamous relationship (no condom)	14.3 (5)	3.6 (1)
I do not know what safe sex is	0 (0)	0 (0)
I have never been sexually active	8.6 (3)	3.6 (1)
How often do you use contraception?		
Never	20 (7)	22.2(6)
Less than ½ of the time	2.9 (1)	7.4 (2)
About ½ of the time	5.7 (2)	11.1 (3)
Most of the time	20 (7)	7.4 (2)
Always	42.9 (15)	44.4 (12)
Not sexually active	8.6 (3)	7.4 (2)

Table 16

Sexual Behaviors (independent samples t-test/sport type comparison)

Variable	Contact M	Contact SD	Contact N	Non-Contact M	Non-Contact SD	Non-Contact N	*t*
STD	1.94	.591	35	1.75	.645	28	1.235
#Number of partners	2.63	1.61	35	2.07	1.412	28	1.440
Safe sex	1.83	1.294	35	1.32	1.020	28	1.694
Contraception use	2.89	1.676	35	2.67	1.776	28	.497

*Note. *p<.05*

Sexual activity among male and female athletes

Pregnancy (yes or no) was compared using a chi-square analysis and there were no significant findings. Remaining sexual behaviors (STDs, number of partners, contraception use) were compared using independent samples t-tests and none of the findings were significant. There was a trend (p=.072) when comparing male athletes (M=2.00, SD=.000) and female athletes (M=1.71, SD=.864; t (61)=1.871, p=.072) regarding reported STDs (see Table 17). Females reported having "1 or more than 1" STDs 19.3% whereas the males reported no cases.

Both males and females rates of "always use a condom" were below 50% (see Table 18), this is a worrisome statistic when sexually transmitted diseases are a continued growing problem in the young adult population.

Table 17
Sexual Behaviors (independent samples t-test/gender comparison)

Variable	Male M	Male SD	Male N	Female M	Female SD	Female N	*t*
STD	2.00	.000	32	1.71	.864	31	1.871
#Number of partners	2.25	1.606	32	2.52	1.480	31	-.683
Safe sex	1.72	1.301	32	1.48	1.092	31	.775
Contraception use	2.53	1.796	32	3.07	1.596	31	-1.238

Note. *p<.05

Table 18

Sexual behaviors (frequencies/gender comparison)

Variable	Males % (N)	Females % (N)
Number of STD's		
Yes, 1 time	0 (0)	16.1 (5)
More than 1 time	0 (0)	3.2 (1)
Never	100 (32)	77.4 (24)
Pregnant (or been involved)		
Yes	6.3 (2)	12.9 (4)
No	90.6 (29)	83.9 (26)
Number of sexual partners (last 12 months)		
Not sexually active	15.6 (5)	9.7 (3)
1 partner	28.1 (9)	22.6 (7)
2 partners	12.5 (4)	16.1 (5)
3 partners	3.1 (1)	9.7 (3)
More than 3 partners	40.6 (13)	41.9 (13)
Safe sex practices		
I have become abstinent	9.4 (3)	12.9 (4)
Always use condom	43.8 (14)	48.4 (15)
Use condom sometimes	31.3 (10)	22.6 (7)
Monogamous relationship (no condom)	6.3 (2)	12.9 (4)
I do not know what safe sex is	0 (0)	0 (0)
I have never been sexually active	9.4 (3)	3.2 (1)
How often do you use contraception?		
Never	28.1 (9)	13.3 (4)
Less than ½ of the time	3.1 (1)	6.7 (2)
About ½ of the time	6.3 (2)	10 (3)
Most of the time	18.8 (6)	10 (3)
Always	37.5 (12)	50 (15)
Not sexually active	6.3 (2)	9.7 (3)

Gambling among contact and non-contact athletes

A chi-square test was used to compare contact and non-contact athletes in overall gambling behavior (yes or no), no significant differences were found (see Table 19). A Mann-Whitney U test was performed on type of gambling and frequency of gambling, no significant differences were found, z=-.249, p=.804 & z=-1.141, p=.254 (see Table 20). Of the contact sport athletes, 40% reported having gambled in the last 12 months versus 53.6% of the non-contact athletes. No one in this sample reported sports wagering.

Table 19
Gambling behavior (Chi square, sport type comparison)

Sport Type	Gambling Yes	Gambling No	Total
Contact			
Count	14	20	34
Expected count	15.9	18.1	34.0
% within Sport type	41.2	58.8	100.0
% within gambling	48.3	60.6	54.8
% of total	22.6	32.3	54.8
Non-Contact			
Count	15	13	28
Expected count	13.1	14.9	28.0
% within sport type	53.6	46.4	100.0
% withing gambling	51.7	39.4	45.2
% of total	24.2	21.0	45.2
Total			
Count	29	33	62
Expected count	29.0	33.0	62.0
% within Sport type	46.8	53.2	100.0
% within gambling	100.0	100.0	100.0
% of total	46.8	53.2	100.0

Note. $\chi^2(1)=.948$, $p=.330$ *(not significant at* $p<.05$ *level)*

Table 20
Gambling behaviors (Mann-Whitney U, sport type comparison)

	Sport Type	N	Mean Rank	Sum of Ranks
Type	Contact	17	19.50	331.50
	Non-contact	22	20.39	448.50
	Total	39		
Quantity	Contact	34	33.65	1144.00
	Non-contact	28	28.89	809.00
	Total	62		
Note. p=.804 (type) & p=.254 (quantity). Not significant at p<.05 level.				

Gambling among male and female athletes

A chi-square was used to compare male and female athletes in overall gambling behavior (yes or no). A significant difference was found in the proportion of male athletes (68.8%) versus the number of female athletes (22.6%) that gamble; χ^2 (1)=12.829, p=.000 (see Table 21).

A Mann-Whitney U test was conducted to compare types of gambling and quantity of gambling between male and female athletes. The results of the test were significant for both behaviors, z=-2.072, p=.038 for type of gambling behavior and z=-3.043, p=.002 for quantity of gambling (see Table 22).

Table 21
Gambling behavior (Chi-square, gender comparison)

Sex	Gambling Yes	Gambling No	Total
Male			
Count	22	10	32
Expected count	15.0	17.0	32.0
% within Sex	68.8	31.3	100.0
% within gambling	75.9	30.3	51.6
% of total	35.5	16.1	51.6
Female			
Count	7	23	30
Expected count	14.0	16.0	30.0
% within Sex	23.3	76.7	100.0
% withing gambling	24.1	69.7	48.4
% of total	11.3	37.1	48.4
Total			
Count	29	33	62
Expected count	29.0	33.0	62.0
% within Sex	46.8	53.2	100.0
% within gambling	100.0	100.0	100.0
% of total	46.8	53.2	100.0

Note. $\chi^2(1)=12.829, p=.000$

Table 22
Gambling behaviors (Mann-Whitney U, gender comparison)

Sex	N	Mean Rank	Sum of Ranks
Type			
Male	25	17.26	431.50
Female	14	24.89	348.50
Total	39		
Quantity			
Male	32	25.39	812.50
Female	30	38.02	1140.50
Total	62		

Note. Mann Whitney U test, z=-2.072, p=.038 & z=-3.043, p=.002.

Summary of significant finding for all health risk-taking behaviors

Significant finding in health risk taking behaviors include: In-season alcohol frequency when comparing contact and non-contact athletes, marijuana use in the past 12 months when comparing contact and non-contact athletes, gambling in the past 12 months and type and quantity of gambling behaviors when comparing male and female athletes (see Table 23).

Table 23
Health risk-taking behavior significant findings (sport type comparisons)

Variable	**t, z or χ^2**	**p**
In-season alcohol frequency (contact vs. non-contact)	t (61)= -2.264	.027*
Marijuana use over past 12 months (contact vs. non-contact)	t (61)= -2.493	.017*
Gambling (male vs. female)	χ^2=12.829	.000*
Gambling type (male vs. female)	z=2.072	.038*
Gambling quantity (male vs. female)	z= -3.043	.002*

*Note. *p<.05*

Sensation seeking among contact and non-contact athletes

Independent samples t-tests were conducted comparing sensation seeking traits of contact and non-contact athletes (see Table 24). The Brief Sensation Seeking Scale (BSSS) is composed of eight questions and each subscale consists of two questions and they are scored on a likert scale 5 to 1 (5=Strongly agree, 4=Agree, 3=Neutral, 2=Disagree, 1=Strongly disagree). Scores were combined to obtain an overall mean for the subscale, therefore a high sensation seeker would have a mean range from 8-10 and a low sensation seeker would be in the range of 2-4, those falling in between would be considered neutral.

No significant differences were found; however, there was a trend in scores for contact (M=7.38, SD=2.075; t (60)=1.929, p=.058) and non-contact (M=6.26, SD=2.401) sports in the thrill and adventure seeking subscale. The magnitude of differences in the means was moderate (eta square .06).

Table 24
Sensation Seeking (independent samples t-test/sport type)

Variable	Contact M	Contact SD	Contact N	Non-contact M	Non-Contact SD	Non-contact N	*t*
Total Experience Seeking	9.03	1.185	33	8.50	1.816	28	1.324
Boredom Susceptibility Total	7.82	1.507	34	7.50	1.478	28	.849
Thrill & Adventure Seeking Total	7.38	2.075	34	6.29	2.401	28	1.929
Disinhibition Total	6.62	2.283	34	6.11	2.114	28	.906

*Note. *p<.05*

Sensation seeking among male and female athletes

Independent samples t-tests were conducted comparing sensation seeking traits of male and female athletes (see Table 25). The BSSS scores were combined to obtain an overall mean for the subscale, therefore a high sensation seeker would have a mean range from 8-10 and a low sensation seeker would be in the range of 2-4, those falling in between would be considered neutral.

There was a significant difference in scores for male (M=9.25, SD=1.391) and female (M=8.33, SD=1.516; t (60)=2.483, p=.016) athletes on the experience seeking subscale. The magnitude of differences in the means was moderate to large (eta squared=.08). All other subscales had no significant findings (see Table 26).

Scores were also recoded to find a total BSSS and this was done by combining all 8 scores on the likert scale, high sensation seeker scores would range from 32-40, middle sensation seeker scores range from 17-31 and low sensation seeker scores range from 8-16. In this sample there were no low sensation seeking student-athletes and in the overall sample (n=61), 42.6% reported high sensation seeking traits and 57.4% reported middle sensation seeking traits. When these were broken down by sex, 53.1% of males reported high sensation seeking as compared to only 31% of females. There were no significant differences in total BSS when males and females were compared.

Table 25

Sensation seeking (independent samples t-test/gender)

Variable	Male M	Male SD	Male N	Female M	Female SD	Female N	*t*
Total Experience Seeking	9.25	1.391	32	8.33	1.516	30	2.483*
Boredom Susceptibility Total	7.63	1.519	32	7.73	1.484	30	-.284
Thrill & Adventure Seeking Total	7.09	2.428	32	6.67	2.123	30	.735
Disinhibition Total	6.72	2.218	32	6.03	2.173	30	1.228

*Note: *p<.05.*

Table 26

Sensation seeking (Frequencies)

Subscale Totals	Contact % (N)	Non-Contact % (N)	Male % (N)	Female % (N)
Experience Seeking				
High (8-10)	88.2 (30)	71.4 (20)	87.6(28)	73.4 (22)
Low (2-4)	0 (0)	3.6 (1)	3.1 (1)	0 (0)
Boredom Susceptibility				
High (8-10)	64.7 (22)	60.7 (17)	62.6(20)	61.3 (19)
Low (2-4)	2.9 (1)	3.6 (1)	3.1 (1)	3.2 (1)
Thrill & Adventure				
High (8-10)	50 (17)	39.3 (11)	75.1(17)	36.7 (11)
Low (2-4)	11.8 (4)	32.1 (9)	15.7 (5)	25.8 (8)
Disinhibition				
High (8-10)	41.1 (14)	24.9 (7)	40.7(13)	25.8 (8)
Low (2-4)	26.4 (6)	25 (7)	15.7 (5)	25.8 (8)

Off-season health risk taking behavior and sensation seeking

The BSSS (Hoyle, 1999) consists of 8 questions scored on a likert scale from 5 to 1 (5=Strongly agree, 4=Agree, 3=Neutral, 2=Disagree, 1=Strongly disagree). Scores were combined for a total score on the BSSS, therefore "high sensation seekers" scores would range from 32-40 and scores for the "middle" would range from 17-31 and the "low sensation seekers" would range from 8-16. Analyzing the frequencies for this population with the new total score. There were fewer "high sensation seekers" (41.3%) than "middle sensation seekers" (55.6%) and no athletes reported "low sensation seeker."

An independent sample t-test was conducted to compare the in-season and off-season risk taking behaviors (alcohol frequency, quantity of drinks per sitting and marijuana quantity per week) between high and middle sensation seekers (see Table 27). There were no significant differences in regards to in-season alcohol frequency or in marijuana quantity in both the in and off-seasons.

There were however significant differences between high (M=2.92, SD=1.262) and middle to low (M=1.43, SD=1.335; t (59)=4.425, p=.000) sensation seekers in reference to quantity of alcohol per sitting during the off-season. The magnitude of the differences in the means was very large (eta squared=.24).

There was also a significant difference found between high sensation seekers (M=1.31, SD=1.594) and middle to low sensation seekers (M=.46, SD=.780; t (34)=2.507, p=.017) when looking at in-season quantity of alcohol per sitting. The magnitude of the differences in the means was moderate to large (eta squared=.096).

Another significant difference was found when comparing high (M=1.73, SD=.874) and middle to low (M=1.06, SD=.998; t (59)=2.745, p=.008) frequency of alcohol use during the off-season. The magnitude of differences in the means was moderate to large (eta squared=.11).

The relationship between sensation seeking (BSS), gender and health risk behaviors (alcohol use, marijuana use, gambling & sexual risk) was investigated using Spearman rank order correlation. There was a medium-large positive correlation between high sensation seeking and off-season alcohol quantity [r (59) = .503, p<.05], with high levels of total sensation seeking associated with high quantities of alcohol per sitting in the off-season (see Table 28). There were also medium-large positive correlations between levels of sensation seeking among males [r (30) = .482, p<.001] and female [r (27) = .498, p<.001] athletes and off-season alcohol quantity.

Table 27
In-Season & Off-season Alcohol & Marijuana Behaviors & BSSS

Variable	**High SS M**	**High SS SD**	**High SS N**	**Mid-Low SS M**	**Mid-Low SS SD**	**Mid-Low SS N**	***t***
Off-season alcohol frequency	1.73	.874	26	1.06	.998	35	2.745*
Off-season alcohol quantity per sitting	2.92	1.262	26	1.43	1.335	35	4.425*
In-season alcohol frequency	.77	.765	26	.51	.781	35	1.272
In-season alcohol quantity per sitting	1.31	1.594	26	.46	.780	35	2.507*
Off-season marijuana frequency	.38	1.098	26	.20	.584	35	.848
In-season marijuana frequency	.27	.874	26	.03	.169	35	1.384

*Note. *p<.05*

Table 28

Spearman rank order correlation (BSS & Risk taking behaviors)

	Sensation Seeking	MALE	FEMALE
Off-season alcohol freq.	.382**	.387*	.416*
Off-season alcohol quant.	.499**	.482**	.498**
In-season alcohol freq.	.207	.290	.101
In-season alcohol quant.	.295*	.319	.186
Past 12 month marijuana use	.082	.103	-.023
Off-season marijuana quant.	.028	.094	.044
In-season marijuana quant.	.178	.169	.278
No. of partners	.161	.281	.056
STD	-.282*	-	-.329
Contraception	-.183	-.565	.244
Pregnancy	-.138	-.026	-.219
Gambling	.158	.177	-.138

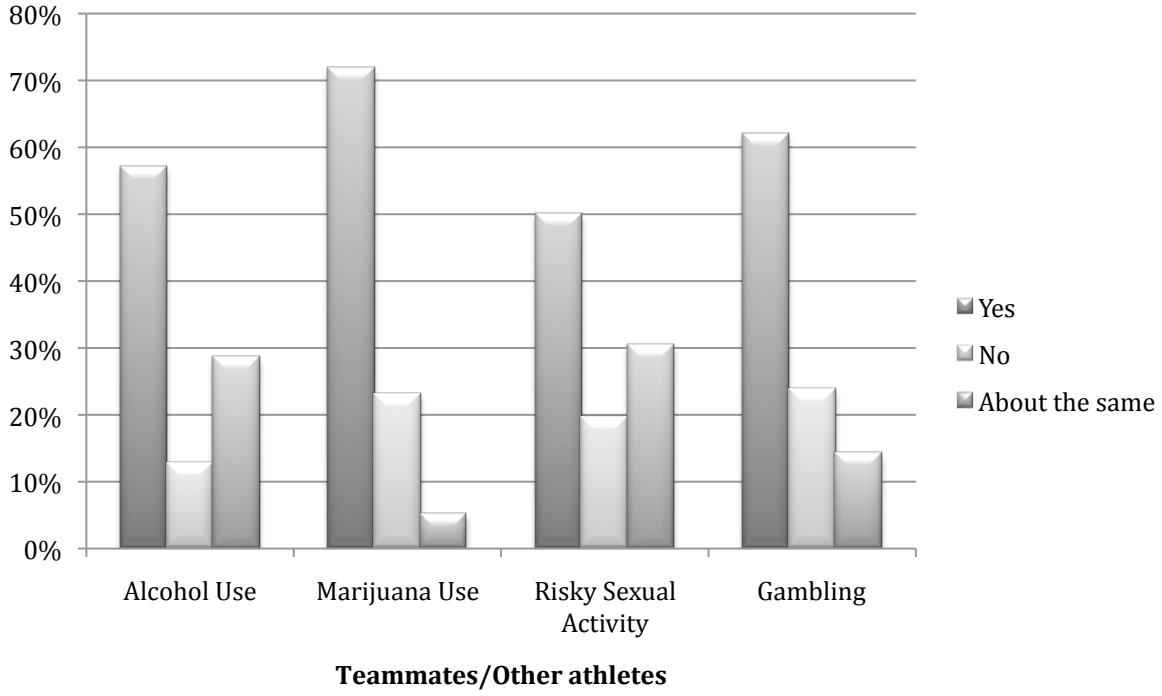
Notes: Gender and sensation seeking were dummy coded (male=1, female=2; high=1, middle=0). *p<.05; **p<.001

Perceived norms among other athletes/teammates and general college population

Perceived norms were assessed by asking the question "Do you feel that your teammates or athlete's from other teams drink alcohol (smoke marijuana, engage in risky sexual behaviors or gamble) more than you do?" The same question was also asked in reference to the general college population or those non-athletes. The scale consisted of "yes," "no," "about the same," and "I don't drink (smoke, engage in risky sex or gamble)." When calculating frequencies the data was recoded so those who did not drink, smoke, engage in risky sex or gamble were omitted and just those that answered "yes=3," "no=1," or "about the same=2" were used in frequency counts (see Figures 3 & 4).

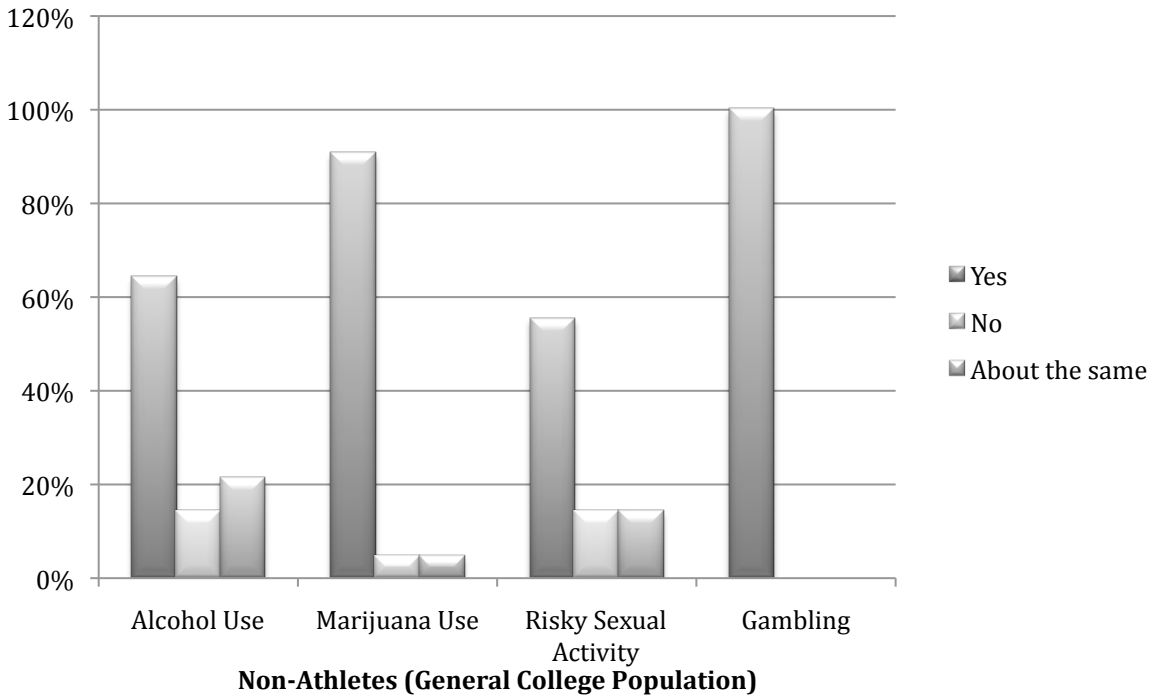
Perceived norms for alcohol use when compared to other athletes or teammates were (n=56): 57.1% (yes), 12.7% (no) and 28.6% (about the same). Norms for marijuana use when compared to teammates or other athletes were (n=39): 71.8% (yes), 23.1% (no) and 5.1% (about the same). When comparing their risky sexual behaviors to those of teammates and other athletes the frequencies were (n=56): 50% (yes), 19.6% (no) and 30.4% (about the same). Gambling perceived norms (n=42) were: 61.9% (yes), 12.7% (no) and 28.6% (about the same).

Figure 3
Perceived norms (teammates & other athletes-frequencies)



When comparing themselves to the general college population or non-athletes the frequencies for alcohol use (n=56) were: 64.3% (yes), 14.3% (no) and 21.4% (about the same). The athletes have the perception that the non-athletes or general college population engage in marijuana use at very high rates when compared to themselves (n=42): 90.7% (yes), 4.7% (no) and 4.7% (about the same). Comparisons of risky sexual behaviors (n=56) were: 55.4% (yes), 14.3% (no) and 14.3% (about the same). Interestingly, when they were asked about gambling, 100% (n=33) reported that they believed the general college population or non-athletes engaged in gambling more than they did.

Figure 4
Perceived norms (non-athletes/general college population-frequencies)



Correlations to access the relationship between health risk taking behaviors and perceived norms were also conducted (see Table 29). Perceived norms of the subjects risk taking behaviors (alcohol, marijuana, sexual risk and gambling), when compared to other athletes or teammates showed no relationships. There were also no relationships found when comparing the subjects' risk taking behaviors to those perceptions of the non-athlete or general college population.

Table 29
Spearman rank order correlations (perceived norms and health risk taking behaviors)

Health risk taking behaviors	Other athletes or teammates	Non-athletes (general college pop.)
Off-season alcohol freq.	-.042	-.273
Off-season alcohol quant.	-.055	-.202
In-season alcohol freq.	-.108	-.120
In-season alcohol quant.	-.089	-.208
Past 12 month marijuana use	.050	-.011
Contraception	-.077	-.334*
Gambling	-.069	-.225

Note: *p<.05

CHAPTER 5

Discussion

The intent of chapter five is to give an overview of the present study as well as interpret the research findings. This chapter is divided into six sections: (1) summary, (2) summary of research question findings, (3) conclusions from research findings, (4) strengths and weaknesses of study (5) future studies and (6) recommendations.

Summary

The research design for this study consisted of the administration and analysis of several survey measures. The instruments used were: Lifestyle Assessment for Intercollegiate Athletes (Nattiv & Puffer, 1991), Brief Sensation Seeking Scale (Hoyle, 1999), Rosenberg Self-Esteem Scale (Rosenberg, 1965) and questions pertaining to perceived norms created by the researcher. The sample was selected from various NAIA colleges/universities in the eastern Missouri and southern Illinois area. For this study the sample was 63. To answer the research questions, independent samples t-tests, and non-parametric tests Chi-square, Spearman rho correlation and Mann-Whitney U were performed on the data.

The purpose of this study was to assess the frequency of health risk-taking behaviors of NAIA college athletes, to determine if there are differences between those athletes who participate in contact sports versus those who are considered non-contact, to determine if there are differences between genders, to establish the presence of sensation seeking in those who have higher levels of risk taking behavior and to determine if athletes perceived differences in their risk taking when compared to other athletes and the non-athlete/general college population.

The research questions in this study were:

1. Are there differences in health risk-taking behaviors between athletes involved in contact/collision sports versus non-contact sports and do these differences exist between genders?

2. Are there differences in sensation seeking behaviors between athletes who are involved in contact/collision sports versus non-contact sports and do these differences exist between genders?

3. When comparing in-season and off-season, do high sensation seeking athletes take part in health risk taking behaviors more than their low sensation seeking counterparts?

4. Do athletes perceive differences in their risk-taking behaviors (drinking, marijuana use, risky sexual behavior and gambling) when compared to (a) others on their team or on other athletic teams and (b) non-athletes or general college population?

Summary of Research Question Findings

In this study a sample of NAIA student-athletes were surveyed so as to investigate their health risk-taking behaviors, sensation seeking behaviors and perceived norms. Comparisons were made by gender and sport type (contact or non-contact). In the following discussion the researcher will present the significant findings of the present study.

The annual prevalence for alcohol use among college students, as measured by The CORE Institute (2006), is 84.1%. The annual prevalence for the population (male and female athletes) sampled for this study was 81% (during off-season) and only 51.8% (in-season). Marijuana use among college students is 30.1% (CORE, 2006) annually; this sample reported an annual use of 34.9%. Statistics for sexual risk taking are not assessed by CORE, they measured only by The National College Health Behavior Survey

(NCHBS) and National College Assessment (NCHA). The NCHBS has not been administered since 2001 and the NCHA only looks at last 30 days and not annual prevalence of health risk taking behaviors.

Differences in health risk taking behaviors among contact & non-contact athletes

Contact athletes made up 55.6% of the sample and non-contact athletes 44.4%. The contact athletes were from the sports of men and women's soccer and football and non-contact sports were baseball, softball and volleyball. There were significant findings in health risk-taking behaviors regarding in-season alcohol frequency (how often they reported use of alcohol during a typical in-season). The interesting finding here was that the non-contact athletes reported higher frequencies during the off-season than those contact athletes. This finding contradicts the literature, Nattiv, Puffer & Green (1997) found that athletes in contact sports had a greater quantity and frequency of alcohol consumption than did those non-contact sports. Kueffler et al. (2005) also found significant differences in the alcohol usage between sports teams, wrestling (contact sport) had higher rates of usage when compared to volleyball, softball & track (non-contact).

No other significant differences were found upon comparison of other alcohol related behaviors and sport type. Those athletes in contact sports reported not drinking (62.9%) during in-season. Five studies (Bower & Martin, 1999; Martin, 1998; NCAA, 2001; Selby, Weinstein & Bird, 1990; Thombs, 2000) examined the relationship between seasonal status and alcohol consumption among intercollegiate athletes. All of these studies indicated alcohol consumption was lower during the athletes' competitive seasons. This studies finding agree with this literature and found that more athletes

(contact & non-contact) consume more alcohol in the off-season than they do when they are in-season.

Significant differences were found when comparing contact and non-contact athletes and the overall use of marijuana in the past 12 months. Non-contact athletes (25%) were more likely to report overall use of "more than 20 times" as compared to athletes in contact sports (2.9%). There were no differences between the groups when comparing in-season and off-season frequency of marijuana use. There was nothing found in the literature comparing contact and non-contact athletes and frequency of use of marijuana.

No significant differences were found in any of the risky sexual activity questions (STDs, pregnancy, frequency of use of contraception, frequency of use of condoms). Regarding use of contraception it was alarming to see that under 50% of both sport types reported using contraception all of the time. Nattiv & Puffer (1991) found that athletes were less likely to use contraception than their non-athletic peers.

Contact sport athletes (51.4%) also reported having more sexual partners (3 or more) in the past 12 months than those non-contact athletes (28.6%). Although this finding was not significant it agrees with the literature by Nattiv & Puffer (1991) and Chandler (1999) showing that athletes are more sexually active and have more sexual partners. However, these articles did not compare contact to non-contact athletes. They presented only an overall summation of athlete behaviors.

Gambling behaviors between contact and non-contact sport athletes had no significant findings in overall gambling in the past 12 months, type of gambling and frequency of gambling. Only 2 athletes reported sports wagering as the type of gambling they engaged in with the most commonly engaged in gambling being casino and card games for money. The literature shows that the two sports that reported the highest

frequency were men's football and men's basketball (NCAA, 1996). However, in this study there were only eight football players and no men's basketball players surveyed. The literature does not address contact and non-contact athletes in reference to gambling behaviors. Overall only 29 (46%) of the sample reported gambling of any type in the past 12 months. Cross et al. (1998) discovered that student-athletes who engage in sports wagering were also more likely to be risk-takers and Gupta, Derevensky & Ellenbogen (2006) found that certain personality types (sensation seekers) are more likely to develop gambling problems. There were no significant differences when I compared total BSS and gambling.

Differences in health risk-taking behaviors among male and female athletes

There were no significant differences when comparing male and female athletes when looking at the questions of off-season alcohol frequency and quantity or in-season frequency. Both males and females reported less or no drinking during the competitive season. There was a trend (p=. 064) when comparing in-season alcohol quantity between genders. However, the literature defines "binge" drinking for males as 5 or more drinks per setting for males and 4 or more per sitting for females. In this sample 37.5% of males reported drinking 5 or more drinks per sitting in the off-season while 32.3% of females reported 4 or more drinks per sitting. So the trend that was shown in the data analysis is when male and female athletes are compared at the 5 or more drinks per sitting level. This is consistent with the literature, Wechsler et al. (1997) found a greater percentage of male athletes reported heavy episodic drinking (61% to 50%) however; this study did not discuss whether they were in-season or off-season.

There were no significant findings when comparing male and female athletes in overall marijuana use and frequency during off-season and in-season. Females reported

never using marijuana (71%) in the past 12 months as compared to the males, only 59.4% reported never using marijuana. Even though this finding was not significant it agrees with the literature. LaBrie (2008) and Grossbard (2008) found significant differences when examining sex differences among male and female athletes reporting marijuana use.

There was a trend (p=.072) when comparing male and female athletes reporting STD infections. Females reported having 1 or more STDs (19.3%) whereas males reported no cases. Nsuami et al., (2003) found that during routine STD screens during pre-participation physical examinations the prevalence rates of chlamydial and gonococcal infections to be higher in women than men (6.5% and 2.0% in females, 2.8% and 0.7% in males), with many of those (93%) having no symptoms. Therefore this trend is consistent with some of the literature.

As was discussed previously when comparing contact and non-contact athletes there is an alarming number of male and female athletes who report not using a condom less than 50% of the time. Males reported always using a condom only 43.8% and females only 48.4%. The rates of reported use of contraception all the time are also very low and of concern, the rate of males using contraception always was only 37.5% and females 50%. One question that was not asked in this category was "How often in the past 12 months have you drank alcohol and had unprotected sex?"

Significant differences were found when comparing male and female gambling behaviors in overall gambling, type and quantity of gambling. Only 26.6% of females reported gambling within the past 12 months as compared to 68.8% of males. Much of the literature on gambling is done comparing athletes to non-athletes and not comparing gender.

Differences in BSSS among contact and non-contact athletes

Subscales of the BSSS (Hoyle, 1999) were analyzed. There were no significant differences when comparing contact to non-contact athletes but there was a trend (p=.058) for the subscale thrill and adventure seeking. This finding is consistent with literature comparing body contact sports (i.e. football) to non- body contact sports (Stirling, 1977) who also suggested that those athletes of body contact sports scored higher in thrill and adventure seeking than those in non-body contact sports and non-athletes. However, Straub (1986) and Stroth (1995) found that high-risk sport athletes (contact) scored significantly higher than low-risk athletes (non-contact) on the boredom susceptibility subscales, but did not show any significance in the other scales.

Differences in BSSS between male and female athletes

Comparisons of male and female athletes produced a significant finding in one of the four subscales of the BSSS, males were found to have higher scores on the experience seeking subscale. These findings conflicts with literature from Zuckerman (1991) who found no differences in the experience seeking subscale but differences in the other three subscales. The caveat to this finding is the sample for Zuckerman's (1991) study were college aged (non-athlete) males and females. Davis and Mogk (1994) found that scores on the disinhibition subscale were higher for male athletes than female athletes. When scores on all subscales were totaled together to identify "high" and "low" sensation seekers and this was analyzed there were no significant differences found between male and female athletes.

In-Season and Off-season comparison of BSSS

Scores on the BSSS (Hoyle, 1999) were combined to create a total score in order to rank the sensations seekers as either "high," "middle," or "low." There were no

athletes in this sample who scored as "low" sensation seekers, 26 athletes were in the "high" range while 37 were in the "middle" range. These scores were analyzed with in-season and off-season alcohol and marijuana behaviors and compared. There were no significant differences for in-season alcohol frequency of use, and in & off-season marijuana frequency of use. There were significant differences between high and middle sensation seekers in quantity of alcohol per sitting during the season and off-season and frequency of alcohol use in the off-season.

The relationship between sensation seeking and health risk behaviors was investigated using Spearman rank order correlation. There were medium-large correlations between high sensation seeking and off-season quantity of alcohol, this correlation was also found for both male and female athletes.

Perceived norms of athletes compared to other athletes and general college population

Peers are typically the strongest influence of personal behaviors in late adolescence as well as traditional college students (Lo, 1995; Perkins, 1985). Reference or peer intensive groups can guide behaviors and the overestimation of others behaviors can influence alcohol use (Neighbors et al., 2007). College student athletes tend to view their fellow student-athletes, as well as non-athletic peers, as drinking more than themselves (Martens et al., 2006; Thombs, 2000). The frequency data obtained agrees with the literature that athletes tend to hold misperceptions of typical use by fellow athletes (Perkins & Craig, 2006) and that college students tend to view their fellow student-athletes, as well as non-athlete peers, as drinking more than themselves. This tendency to overestimate the extent of peers' risk taking behaviors may make those less likely to view their behaviors as problematic but rather as normal and therefore acceptable.

Spearman rho correlations conducted showed no relationships between perceived norms and health risk taking behaviors of this study's subjects. This does not agree with the literature that has previously shown strong positive correlations when compared to the subjects' identifying peer group (Thombs et al., 1997; Grossbard et al., 2009).

Conclusions of research findings

The following are conclusions based on the findings of this study:

1. Non-contact sport athletes engaged in more in-season alcohol use more frequently than contact-sport athletes.
2. Non-contact sport athletes engaged in more marijuana use in the past 12 months than did contact-athletes.
3. No differences were found between male and female athletes alcohol, marijuana use and risky sexual behaviors.
4. Males engaged in more gambling behavior (overall, type & frequency) than female athletes.
5. Female athletes reported lower scores on the BSSS experience seeking subscale than did males.
6. No differences were found between contact and non-contact athletes on the BSSS and health risk taking behaviors.
7. Athletes perceived more gambling and marijuana use by non-athletes (general college population).
8. Athletes perceived other athletes and teammates as well as the general college population as engaging in more health risk-taking behaviors.

9. Correlations found no relationships between health risk taking behaviors and perceived norms (as compared to other athletes and the general college population).

Strengths and weaknesses of study

Strengths of this study include: (1) NAIA student-athletes have not been studied in the literature so this is a novel study in and of itself and (2) the findings from this study fit well with findings in the literature that have been conducted using NCAA student-athletes.

This study was able to tie in the theories presented. By asking questions related to sensation seeking (risk perception) and perceived norms (perceptions of social environment) the study was able to gain insight into some of the central issues that are suggested by The Causal Model (Irwin & Millstein, 1986). Sensation seeking, which is comprised of risk perception and danger invulnerability and perceived norms or how the subject perceives their social environment in relation to certain health risk taking behaviors. These concepts are core tenants of this model and need to be understood fully in order to better use the model as a framework for understanding health risk taking and creating programs that address these behaviors. While the Sensation Seeking Theory (Zuckerman, 1979) is predominately biological in nature, and unable to be studied fully here, the main idea of this theory is that those with the sensation seeking trait will take more risks than those without such a trait. These individuals are more likely to perceive risks as not dangerous or negative. By using the Brief Sensations Seeking Scale (Hoyle, 1999) this study was able to attain where the subject fell along the sensation seeking continuum. The Social Norms Theory (Perkins & Berkowitz, 1986) discusses the idea that there are often misperceptions when comparing the behaviors of self to the behaviors

of others (especially close peer groups). The questions asked in this study were very basic in nature. The purpose of the questions was to ascertain how this group perceived the health risk taking behaviors of their closest peer group (teammates and other athletes) and other groups (non-athletes) as compared to their own.

Methodologically there were a number of flaws. First and foremost data collection was a central problem. There was an overestimation that more athletes would be in the athletic training facilities at the times arranged and a more diverse sampling would have been obtained. For future studies arrangements to collect data should be made to have some time during a team meeting or during times of pre-participation physical examinations. In the future it might also be necessary to have others help give the survey or to make it a web-based survey. Sample size was low at 63 and sample sizes need to increase and more schools recruited from across the country would lend to a better understanding of the research questions and findings.

Other problems include questions asked or not asked on the survey. A number of questions should have been asked differently and choices for some of the questions changed. Use of health risk behavior scales that are already validated such as, The Centers for Disease Control's (CDC) National College Health Risk Behavior Survey (NCHRBS) or the National College Health Assessment (NCHS) done by the American College Health Association might alleviate some of the reliability issues. Questions that were discussed in the literature, such as asking about alcohol use and unprotected sexual activity and negative consequences might have provided more insight into some of the health risk-taking behaviors. The scale used to measure perceived norms was created by the researcher and not tested by the literature. While this scale was a place to start and revealed some frequency data there are better more developed scales available.

Instead of looking at past 12 month activity/use ask about the past 30 days or even two weeks (this method was used in literature by Wechsler) and turn it into a longitudinal study and look at the same population when they are in-season and again in the off-season. Also, getting a wider variety of sports to compare not only contact and non-contact but look at those sports that are considered individual (i.e. golf & tennis) and compare those to the team sports in many of the health risk-taking behaviors, sensation seeking and perceived norms.

Future studies

There are many avenues that can be taken with this research and continuing to look at NAIA athletes and health risk taking behaviors and perceived norms. The NCAA has been involved in the realms of monitoring and education of the student-athlete for years. However, as discussed earlier, the NAIA leaves it completely up the individual institutions to do their own education and drug testing if they feel a need, there are no overall rules or regulations that the NAIA schools must meet. Of the three schools that were used to collect data for this research none of them administered regular drug tests nor did they employ any educational sessions to new or veteran athletes concerning various health risk-taking behaviors.

This study has just scratched the surface and some of the findings were quite interesting and need to be explored further, the following are future studies recommended for this research:

1. A larger more diverse sample of student-athletes from the NAIA (this includes United States and Canada).
2. Survey of NAIA institutions looking at their use of educational programs and monitoring for substance use.

3. Differences in perceived norms and actual health risk-taking behaviors.

4. Perceived norms and team attraction or team status.

5. Social norms and the prevention of health risk-taking behaviors.

6. The Five Factor Model of personality and its relation to health risk-taking behaviors and sensation seeking.

7. Sensation seeking and risk association.

Recommendations

Recommendations based on the findings of this study are as follows:

1. More stringent guidelines concerning educational and substance use monitoring of student-athletes by the schools and NAIA.

2. Use of the pre-participation physical examination to explore student-athlete health risk-taking behaviors.

3. Increased involvement by the sports medicine staff concerning education and wellness.

4. Increased involvement and commitment from the administration to budget for education and monitoring.

5. Requirements for student-athletes to take educational courses dealing with health-risk taking behaviors throughout the course of their sport involvement.

6. Develop specific educational models that focus on normative behavior, self-esteem and identity/confidence.

7. Present the results of a more comprehensive study to the NAIA and suggest detailed educational courses developed for student-athletes.

Final Comments

Based on the findings of this study there could be potential problems regarding health risk-taking behaviors and student-athletes at these NAIA institutions. In the US, a number of risk-related health markers, including unintentional injury, binge drinking, drug use and sexually transmitted infections (Park et al., 2006) peak during the time of adolescence extending into adulthood or emerging adulthood (Arnett, 2000). When institutions accept these student-athletes on campus or offer them scholarships they are also committing to taking care of their overall health and well-being. These young adults are able to make decisions on their own. They still need some guidance and information so they can make good decisions when it comes to their health. Everyone from the administration to the sports medicine staff and the coaches need to be involved in this process.

APPENDICIES

APPENDIX A

IRB APPROVALS

OFFICE OF RESEARCH SUPPORT

THE UNIVERSITY OF TEXAS AT AUSTIN

P.O. Box 7426, Austin, Texas 78713 (512) 471-8871 -FAX (512 471-8873)
North Office Building A, Suite 5.200 (Mail code A3200)

FWA # 00002030

Date: **11/19/09**

PI(s): **Darcy Downey** Department & Mail Code: **INTERCOLL ATHL-MEN**

Title: **Health risk behaviors of collegiate athletes.**

IRB APPROVAL – IRB Protocol # **2007-04-0021**

Dear: **Darcy Downey**

In accordance with Federal Regulations for review of research protocols, the research study listed above has been re-approved for the following period of time:

Your research study has been re-approved from 11/19/2009 - 11/18/2010 . *(expires 12am [midnight] of this date.)*

RESPONSIBILITIES OF PRINCIPAL INVESTIGATOR FOR ONGOING PROTOCOLS:

(1) Report **immediately** to the IRB any unanticipated problems.

(2) Proposed changes in approved research during the period for which IRB approval cannot be initiated without IRB review and approval, except when necessary to eliminate apparent immediate hazards to the participant. Changes in approved research initiated without IRB review and approval initiated to eliminate apparent immediate hazards to the participant must be promptly reported to the IRB, and reviewed under the unanticipated problems policy to determine whether the change was consistent with ensuring the participants continued welfare.

(3) Report any significant findings that become known in the course of the research that might affect the willingness of subjects to continue to take part.

(4) Insure that only persons formally approved by the IRB enroll subjects.

(5) Use **only** a currently approved consent form (remember approval periods are for 12 months or less).

(6) **Protect the confidentiality of all persons and personally identifiable data, and train your staff and collaborators on policies and procedures for ensuring the privacy and confidentiality of participants and information.**

(7) Submit for review and approval by the IRB all modifications to the protocol or consent form(s) prior to the implementation of the change.

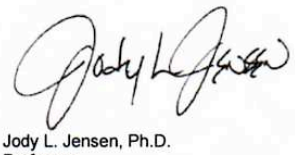
(8) Submit a **Continuing Review Report** for continuing review by the IRB. Federal regulations require **IRB review of on-going projects no less than once a year** (a Continuing Review Report form and a reminder letter will be sent to you 2 months before your expiration date). Please note however, that if you do not receive a reminder from this office about your upcoming continuing review, it is the primary responsibility of the PI not to exceed the expiration date in collection of any information. Finally, it is the responsibility of the PI to submit the Continuing Review Report before the expiration period.

(9) Notify the IRB when the study has been completed and complete the Final Report Form.

(10) Please help us help you by including the above protocol number on all future correspondence relating to this protocol.

Thank you for your help in this matter.

Sincerely,



Jody L. Jensen, Ph.D.
Professor
Chair, Institutional Review Board

SAINT LOUIS UNIVERSITY

*IRB #: 15712

Biomedical IRB
Caroline Bldg, Room C110
(314) 977-7744
Fax (314) 977-7730

OR

Behavioral and Social Sciences IRB
Fusz Memorial Hall, Room 261
(314) 977-2029
Fax (314) 977-2026

REQUEST FOR IRB APPROVAL OF A CHANGE-IN-PROTOCOL OR FOR INFORMATION ONLY OR UNANTICIPATED PROBLEM NOTIFICATION

If an approved study requires a change, it should be submitted to the same IRB office that initially reviewed the study, along with this form and any pertinent materials for review by the appropriate IRB prior to implementation (however, changes may be implemented immediately when it is necessary to eliminate apparent hazards to subjects). This form may also be used to notify the IRB of study related information or unanticipated problems.

***Please fill in the IRB# (top right corner) for the affected study.**
(cells below will expand as needed)

DATE: 1/06/2010	Contact Person (if not PI):
Principal Investigator: Darcy L. Downey	E-mail: ddowney1@slu.edu
Department or Address: 3437 Caroline Mall, Suite #2006 St. Louis, MO 63104	Phone/Pager: 314-977-8637
Study Title: Collegiate Athletes' Health Risk-Taking Behaviors: Reasons & Attitudes	

FOR INDUSTRY SPONSORED STUDIES ONLY (IRB FEES):

☐ **Bill Sponsor - OR -** ☐ **Bill SLU Department**		
Sponsor/CRO Name:		Protocol Number:
Sponsor/CRO Contact:		Address:
E-Mail:	Phone:	
SLU Contact Name:		SLU Billing Address:
E-Mail:	Phone:	

Number of accrued subjects:	43
Status of study: (*check one*)	XX☐ Continuing to accrue study subjects ☐ Closed to accrual Date closed:
Special populations (*mark as applicable*)	☐ Children (< 18 yrs of age) ☐ Prisoner population targeted or study participant became a prisoner

Check one:

XX☐ **This submission involves a Change to an existing protocol**
Complete all sections of this form

☐ **This submission is For Information Only**
Complete section 1 only

☐ **This submission is reporting an Unanticipated Problem (UP)**
How many UPs have been submitted similar to the event being reported? ____
UP with NO changes, complete question 1 only
UP with changes, complete all sections on this form

1) Provide a description of the submission referenced above.

- If the submission involves a **CHANGE**, please provide a description of the change(s) in the box below, including the type of change **AND** what the change involves. For example "Personnel changes include replacing Mary Smith with Ann Jones..." or "Amendment #2 dated xx/xx/xx involves the addition of another X-ray".
  NOTE: If you are submitting a change that originated from an external sponsor, your response below should include the date of the sponsor's correspondence and a brief description of the changes. Include the summary with this submission.
- If the submission is **FOR INFORMATION ONLY**, describe what is being submitted and include any relevant dates (general correspondence dated xx/xx/xx, version dated xx/xx/xx, etc.)
- If the submission is reporting an **UNANTICIPATED PROBLEM**, describe the event, the date the event occurred, the location where the event occurred, and any actions taken as a result of this event.

Changes to existing protocol include: changing anticipated date of ending data collection to 3/30/2010 and

also including letters from various other campuses (IRB or others) consent forms to allow me to come to campus and collect data. These include: Missouri Baptist, Lindenwood Univeristy, McKendree University, Harris Stowe State University and University of Illinois-Springfield. (email correspondence are attached to application).

2) If the submission involves a change, provide the justification (reason) for the changes described above in #1. You may refer to a sponsor's summary if the justification is provided in the summary.

Data collected in original allotted timeframe expired and investigator still needs to collect further data in order to meet subject and power needs.

3) Does the SLU IRB Protocol (application/protocol) need to be modified?

XX☐ Yes
☐ No

4) A: Does the consent document need to be modified?

☐ Yes **In the box below, list affected consent documents (e.g., main consent or assent document, new sub-study, or new addendum consent document) and indicate which section(s) were modified.**

Please submit a revised consent document, a newly-prepared addendum consent, etc. addressing specific changes. Please update the version date (i.e., the footer) for all affected documents.

XX☐ No **In the box below, explain why the consent document does not need updating (subjects are not affected by the change, the study is closed to accrual, a waiver of consent was granted for this study, etc.):**

B: Does the HIPAA Authorization document need to be modified?

☐ **Yes,** A revised HIPAA authorization document is included.
☐ **No**
XX☐ **Not Applicable**

NOTE: If the study has not accrued (enrolled) any subjects, please skip question 5.

5) Do currently accrued subjects require notification of the changes? (For example, changes to the role/participation of the subjects, and/or the addition of risks would warrant notification.)

☐ **Yes** **In the box below, please explain how AND when notification or re-consenting will occur:**

XX☐ **No** **In the box below, please indicate why notification will not occur:**

- ☐ Changes are only minor or administrative (e.g., personnel, grammar, formatting changes)
- ☐ Subjects are no longer receiving active study treatment
- XX☐ This study was granted a waiver of consent
- ☐ Other; please explain:

Proposed changes may not be initiated without IRB approval, except when necessary to eliminate apparent immediate hazards to study participants. If the changes increase risk to subjects or make substantial alterations to the protocol, submit an "original" set of revised materials and three (3) complete copies. Otherwise, submit one "original" set of revised materials. Please provide the entire revised document (protocol, consent form, etc.) not just revised pages and be sure to highlight the changes on all sets of materials. Update the version date on affected SLU documents.

Items being submitted (Check all that apply)
[XX] Revised IRB Protocol – SLU version date: 9 / 18 / 2008
[ ] Revised or New Consent (if multiple, be sure to fully

Signature of Principal Investigator:

Date:
1/06/2010

describe in question #4, box 1) – SLU revised version date: ___/___/___
[ ] Revised HIPAA Authorization
[ ] Sponsor Documentation
[ ] Recruitment Material
[ ] Investigator's Brochure dated: ___/___/___
[ ] Other:

For IRB Office Use Only IRB#: 1572

APPROVAL OF A CHANGE-IN-PROTOCOL, FOR INFORMATION ONLY, OR UNANTICIPATED PROBLEM NOTIFICATION

___ Materials are for information only
___ Materials are to report an unanticipated problem
X Change(s) are approved on an expedited basis
___ Change(s) approved at IRB meeting of _____ by Board #_____
___ Copies of approved consent/assent form(s) attached

Signature of IRB Chairperson or IRB Designee — Date: 1-14-10

IRB Version: 9/1/08

4

APPENDIX B

LETTER TO ATHLETIC DIRECTORS

Jill Jokerst, Director of Athletics
St. Louis College of Pharmacy
4588 Parkview Place
St. Louis, MO 63104

February 10, 2009

Ms Jokerst:

My name is Darcy Downey and I am a Doctoral Candidate at The University of Texas-Austin and I am also a full-time faculty member at Saint Louis University. I am writing to you in reference to my dissertation research. Just to give you some background on myself, I am and have been a NATABOC Certified/Licensed Athletic Trainer for 13 years and have a great interest in the overall health and well-being of our athletes. I want to be sure we are doing all we can for our student-athletes and risk-taking behaviors can endanger that over-all health and well- being. I am requesting permission to come to your school to recruit athletes to take my survey associated with my dissertation research. The title of my dissertation is *A Look at Health Risk- Taking Behaviors and Sensation Seeking in College Athletes in the NAIA*. The questions contained in this survey cover a wide variety of health risk-taking behaviors, such as, alcohol use, substance use, sexual behavior and gambling practices as well as sensation seeking behavior and various demographic questions.

If you grant me permission to survey your athletes I would contact the athletic trainer(s) and see if they would allow me to spend the day in their facility/facilities to survey athletes while they are getting treatment. The survey takes only about 15-20 minutes and is completely anonymous and confidential. Once the athlete has completed the survey they would seal it in an envelope and it would not be opened until I am ready to do my data analysis. I will not be sharing this information with anyone; it will only be used to conduct my dissertation research. There are no questions identifying the athlete or the school. I assure you this is completely confidential.

I have IRB approval through both Saint Louis University and The University of Texas-Austin. I will also contact the IRB at your school to see if there is any information or application I will need to complete prior to coming to your campus.

By allowing your athletes to participate in this research I hope to be able to identify why athletes choose to take health-risk taking behaviors and design educational interventions to address these risk behaviors to better serve our athletic population.

Please email me your approval or denial at ddowney1@slu.edu. I greatly appreciate your time and cooperation with this research and look forward to hearing from you.

Sincerely,
Darcy Downey, MEd, ATC, LAT
Athletic Training Education Program, Saint Louis University
Doctoral Candidate, University of Texas-Austin

APPENDIX C

SURVEY

The Lifestyle Assessment is designed to assess lifestyle health risk behaviors among college athletes. Your responses are entirely confidential. For each question fill in corresponding scantron item for the one answer that best applies to you. **DO NOT PUT YOUR NAMEON THIS QUESTIONNAIRE OR SCANTRON.**

*In which one intercollegiate sport are you currently participating? (**Answer "yes" for your sport and "no" for all the others)...***

1. Baseball	A=Yes	B=No	10. Lacrosse	A=Yes B=No
2. Basketball	A=Yes	B=No	11. Soccer	A=Yes B=No
3. Crew/Rowing	A =Yes	B=No	12. Swimming	A=YesB=No
4. Cross Country	A=Yes	B=No	13. Tennis	A=Yes B=No
5. Diving	A=Yes	B=No	14. Track	A=Yes B=No
6. Field Hockey	A=Yes	B=No	15. Volleyball	A=Yes B=No
7. Football	A=Yes	B=No	16. Softball	A=Yes B=No
8. Golf	A=Yes	B=No	17. Wrestling	A=Yes B=No
9. Gymnastics	A=Yes	B=No	18. Other	A=Yes B=No

19. What is your living situation?

A=Dormitory
B=Fraternity/sorority
C=Off-campus (parents)
D=Off-campus (not with parents)

20. What is your current team status?

A=Starter B=Reserve C=Injured, not playing

21. How long have you been a member of a University Intercollegiate sports team?

A=Less than 1 year
B=1 year
C=2 years
D=3 years
E=4 years
F=More than 4 years

22. What is your age in years?

A=18-19
B=20-21
C=22-23
D=24 or older

23. What is your sex?

A=Male B=Female

24. Which one of the following best describes your ethnic background?

A=White/Caucasian	C=Chicano/Mexican American	E=Asian or Pacific Islander
B=Black/African-American	D=Latino	F=Other

25. What is your scholarship status?

A=Full	C=Less than ½	E=Walk on
B=3/4 to ½	D=None	

The following questions are regarding drug use, alcohol use, and sexual practices and gambling. Use your experience in the <u>LAST 12 MONTHS</u> as a reference for answering these questions.

26. How often do you drive when you are intoxicated from either drinking or using drugs?

A=Never	D=Always
B=Sometimes	E=I don't drink or use drugs
C=Often	F=I don't drive

27. How often are you a passenger in a car when the driver has had perhaps too much to drink or has been using drugs?

A=Never	C=Often
B=Sometimes	D=Always

28. How often have you used smokeless tobacco?

A=Never, I have never used it	C=A few times per month	E=Once a day
B=Never, I've tried it but I quit	D=A few times per week	F=More than once a day

29. **<u>During the off-season</u>** how often do you usually drink alcoholic beverages?

A=Never, I am not a drinker	C=Every weekend	E=Daily
B=A few weekends a month	D=A few a week & on weekends	F=More than once a day

30. **<u>In a typical off-season week</u>**, how many drinks (i.e. bottle/can of beer, 4 oz. glass of wine or a 1 oz. mixed drink) do you typically have at one sitting?

A=None, I do not drink	C=3 drinks	E=More than 5 drinks
B=1-2 drinks	D=4-5 drinks	

31. **During the in-season,** how often do you usually drink alcoholic beverages?

A=Never, I am not a drinker C=Every weekend E=Daily
B=A few weekends a month D=A few a week & on weekends F=More than once a day

32. **In a typical in-season week**, how many drinks (i.e. bottle/can of beer, 4 oz. glass of wine or 1 oz. mixed drink) do you typically have at one sitting?

A=None, I do not drink C=3 drinks E=More than 5 drinks
B=1-2 drinks D=4-5 drinks

33. How often did you drink alcoholic beverages to handle stress or other problems?

A=Never B=Sometimes C=Often D=Always

34. How often have you taken cocaine, amphetamines, or other stimulants (not including prescription medications or caffeinated beverages)?

A=Never C=Once E=More than 20 times
B=3-10 times D=11-20 times

35. How often have you smoked marijuana?

A=Never C=Once E=More than 20 times
B=3-10 times D=11-20 times

36. **In a typical off-season week**, how often do you smoke marijuana?

A=Never C=3 times E=More than 5 times
B=1-2 times D=4-5 times

37. **In a typical in-season week**, how often do you smoke marijuana?

A=Never C=3 times E=More than 5 times
B=1-2 times D=4-5 times

38. How often have you smoked marijuana to handle stress or other problems?

A=Never B=Sometimes C=Often D=Always

39. Have you had a sexually transmitted disease such as gonorrhea, Chlamydia, syphilis, herpes, genital warts or other?

A=Yes, 1 time B=More than 1 time C=No, never

40. Have you ever been pregnant (females) or been involved with a pregnancy (males)?

A= Yes B=No

41. How many sexual partners have you had?

A=No partners C=2 partners E=More than 3 partners
B=1 partner D=3 partners

42. How would you describe your sexual behavior regarding "safe sex" and prevention of AIDS & STD's?

A=I have become abstinent
B=I always use (or partner uses) a condom
C=I use a condom (or partner uses) some of the time
D=I do not use a condom but have a safe monogamous relationship
E=I do not know what "safe sex" is
F= I have never been sexually active

43. How often do you or your partner use a contraceptive (birth control) method?

A=Never C=About ½ of the time E=Always
B=Less than ½ of the time D=Most of the time F=I have never been sexually active

44. What **one** type of contraception do you or your sexual partner use most often?

A=Birth Control Pill
B=Intrauterine Device (IUD)
C=Condom alone
D=Foam or other spermicide alone
E=Rhythm or withdrawal method
F=Diaphragm, sponge or cervical cap
G=Norplant device
H=NuvaRing
I=Sexually active, use no contraception
J=I'm not sexually active

45. Have you ever participated in any form of gambling behavior?

A=Yes B=No

46. **If you answered, "yes" to question #45, what type of gambling did you engage in?**

A=Sports wagering C=Card games for money E=Dog or Horse racing
B=Online poker D=Casino gambling F=Other

47. How often do you gamble?

A=Daily C=Monthly E=Never, I do not gamble
B=Weekly D=Several times per year

48. What is the **main** reason you engaged in drinking alcohol?

A=To handle stress or other problems C=Peer pressure E=I do not drink alcohol
B=To fit in with athletic peers D=Relaxation/fun F=To fit in with other college students

49. What is the **main** reason you engaged in taking stimulant drugs (cocaine, amphetamines, others)?

A=To handle stress or other problems C=Peer pressure E=I do not take drugs
B=To fit in with athletic peers D=Relaxation/fun F=To fit in with other college students

50. What is the **main** reason you engaged in smoking marijuana?

A=To handle stress or other problems C=Peer pressure E=I do not smoke marijuana
B=To fit in with athletic peers D=Relaxation/fun F=To fit in with other college students

51. What is the **main** reason you engaged in sexual activity?

A=Pressure from boyfriend/girlfriend C=Pleasure E=I do not engage in sexual activity
B=To handle stress or other problems D=To fit in/popularity F=To fit in with other college students

The following questions are in reference to how you feel about others behaviors.

52. Do you feel that your teammates or athlete's from other teams/sports drink alcohol more than you do?

A=Yes B=No C=About the same D=I don't drink

53. Do you feel that the non-athlete's (or general college population) drink more than you do?

A=Yes B=No C=About the same D=I don't drink

54. Do you feel that your teammates or athletes from other teams/sports smoke marijuana more than you do?

A=Yes B=No C=About the same D=I don't smoke

55. Do you feel that the non-athlete's (or general college population) smoke marijuana more than you do?

A=Yes B=No C=About the same D=I don't smoke

56. Do you feel that your teammates or athletes from other teams/sports engage in risky sexual behaviors more than you do?

A=Yes B=No C=About the same D=I don't have sex

57. Do you feel that the non-athlete's (or general college population) engage in risky sexual behaviors more than you do?

A=Yes B=No C=About the same D=I don't have sex

58. Do you feel that your teammates or athletes from other teams/sports engage in gambling more than you do?

A=Yes B=No C=About the same D=I don't gamble

59. Do you feel that the non-athlete's (or general college population) engage in gambling more than you do?

A=Yes B=No C=About the same D=I don't gamble

The following questions are in regards to sensation seeking behaviors.

60. I would like to explore new places.

A=Strongly agree B=Agree C=Neutral D=Disagree E=Strongly disagree

61. I would like to take off on a trip with no pre-planned routes or timetables.

A=Strongly agree B=Agree C=Neutral D=Disagree E=Strongly disagree

62. I get restless when I spend too much time at home.

A=Strongly agree B=Agree C=Neutral D=Disagree E=Strongly disagree

63. I prefer friends who are excitingly unpredictable.

A=Strongly agree B=Agree C=Neutral D=Disagree E=Strongly disagree

64. I like to do frightening things.

A=Strongly agree B=Agree C=Neutral D=Disagree E=Strongly disagree

65. I would like to try Bungee Jumping.

A=Strongly agree B=Agree C=Neutral D=Disagree E=Strongly disagree

66. I like wild parties.

A=Strongly agree B=Agree C=Neutral D=Disagree E=Strongly disagree

67. I would love to have new and exciting experiences even if they are illegal.

A=Strongly agree B=Agree C=Neutral D=Disagree E=Strongly disagree

The following questions relate to self.

68. On a whole I am satisfied with myself.

A=Strongly agree B=Agree C=Disagree D=Strongly disagree

69. At times, I think I am no good at all.

A=Strongly agree B=Agree C=Disagree D=Strongly disagree

70. I feel that I have a number of good qualities.

A=Strongly agree B=Agree C=Disagree D=Strongly disagree

71. I am able to do things as well as most other people.

A=Strongly agree B=Agree C=Disagree D=Strongly disagree

72. I feel I do not have much to be proud of.

A=Strongly agree B=Agree C=Disagree D= Strongly disagree

73. I certainly feel useless at times.

A=Strongly agree B=Agree C=Disagree D=Strongly disagree

74. I feel that I'm a person of worth, at least on an equal plane with others.

A=Strongly agree B=Agree C=Disagree D=Strongly disagree

75. I wish I could have more respect for myself.

A=Strongly agree B=Agree C=Disagree D=Strongly disagree

76. All in all, I am inclined to feel that I am a failure.

A=Strongly agree B=Agree C=Disagree D=Strongly disagree

77. I take a positive attitude toward myself.

A=Strongly agree B=Agree C=Disagree D=Strongly disagree

APPENDIX D

RECRUTIMENT SCRIPT

Script
The University of Texas at Austin

You are being asked to participate in a research study. Your participation is entirely voluntary; you can refuse to participate without penalty or loss of benefits to which you are otherwise entitled. You can stop your participation at any time and your refusal will not impact current or future relationships with UT Austin or participating sites. To do so, simply tell the researcher you wish to stop participation.

The purpose of this study is to examine college athletes' health risk-taking behaviors and to gain an understanding of the reasons and attitudes regarding these health risk behaviors. If you agree to be in this study, we will ask you to complete a 77-item questionnaire that should take approximately 15-20 minutes to complete.

The risks of being in this study are no greater than everyday life, but you may feel uncomfortable answering some of the questions. This survey may involve risks that are currently unforeseeable. If you wish to discuss this information or any other risks you may experience, you may ask questions now or call the Principal Investigator listed on the front page of the consent form.

There is no direct benefit to you by participating in this study and there is no compensation for individuals participating in this study.

No information that will specifically identify you will be asked. All information gathered is anonymous. Any reports that result from this project will use information that has been averaged across all those who participate. The data resulting from your participation may be made available to other researchers in the future for research purposes not detailed within this consent form. In these cases, the data will contain no identifying information that could associate you with it, or with your participation in any study.

The records of this study will be stored securely and kept confidential. Authorized persons from The University of Texas at Austin and members of the Institutional Review Board have the legal right to review the research records and will protect the confidentiality of those records to the extent permitted by law. All publications will exclude any information that will make it possible to identify you as a subject. Throughout the study, the researchers will notify you of new information that may become available and that might affect your decision to remain in the study.

If you have any questions about the study please ask now. If you have questions later, want additional information, or wish to withdraw your participation call the researchers conducting the study. Please call Darcy Downey (Principle Investigator) at 512-558-1882.

References:

Anderson, D.S. & Milgram, C.G. (2001). Promising practices: Campus alcohol strategies. Fairfax, VA: George Mason University.

Arnett, J. (1992). Reckless behavior in adolescence: A developmental perspective. *Developmental Review*, *12*, 339-373.

AP. (2006). Two Fresno College Athletes Charged for Rape. *SF Gate* www.sfgate.com

Azjen, I. & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice Hall.

Bacon, V. L. & Russell, P. J. (2004). Addiction and the College Athlete: The Multiple Addictive Behaviors Questionnaire (MABQ) with College Athletes. *The Sport Journal*, *17*(2).

Baer, J.S. & Carney, M.M. (1993). Biases in the perception of the consequences of alcohol use among college students. *Journal of Studies on Alcohol*,54: 54-60.

Baer, J.S. Stacy, A. & Larimer, M. Biases in the perception of drinking norms among college students. *Journal of Studies on Alcohol,* 52: 580-586.

Bandura, A. (1977). *Social Learning Theory*. Englewood Cliffs, NJ: Prentice Hall.

Bandura, A. (1986). *Social foundations of thought and action*. Englewood Cliffs, NJ: Prentice Hall.

Baird, W. (2007). Pregnancy puts female college athletes in bind. *Nashua Telegraph* www.nashuatelegrah.com

Benedict, J. *Athletes and acquaintance rape.* Thousand Oaks, CA: Sage Publications.

Borsari, B. & Carey, K.B. (2003). Descriptive and Injunctive Norms in College Drinking: A Meta-Analytic Integration. *Journal of Studies on Alcohol,*64(3): 331-341.

Bower, B. L. & Martin, M. (1999). African American female basketball players: An examination of alcohol and drug behaviors. *American College Health*, *48*, 129-133.

Brenner, J. a. S., K. (2007). High-Risk Drinking Characteristics in Collegiate Athletes. *Journal of American College Health*, *56*(3), 267-272.

Bronfenbrenner, U. (1979). Basic Concepts. In The Ecology of Human Development: Experiments by Nature and Design (pp. 16-44). Harvard University Press.

Brooks-Gunn, J., Petersen, A.C. & Eichorn, D. (1985). The timing of maturation and psychosocial functioning in adolescence. *Journal of Youth and Adolescence*, *14*, 3-4.

Butts, F. (2006). A Study of Gambling Activity in a NCAA Division. *The Sport Journal*, *19*(4).

Byrnes, J. P., Miller, D. C., & Schafer, W. D. (1999). Gender Differences in risk taking: A meta-analysis. *Psychological Bulletin*, *125*(3), 367-383.

Cavenar, J. D. & Werman, D. S. (1981). Origins of fear of success. *American Journal of Psychiatry*, *138*, 95-98.

CDC/NCHS. (2008). www.cdc.gov/nchs/

Chandler, S. B., Johnson, D. J., & Carroll, P. S. (1999). Abusive Behaviors of College Athletes. *College Student Journal*, *33*(4), 638.

Cooper, M.L. (1992). Alcohol and increased behavioral risk for AIDS. *Alcohol Research and Health,*16: 64-72.
Cooper, M.L. (2002). Alcohol use and risky sexual behavior among college students and youth: Evaluating the evidence. *Journal of Studies in Alcohol,*(Suppl. 14): 101-117.
CORE Institute. (2001). CORE Alcohol and Drug Survey. Southern Illinois University, Carbondale, IL: Author.
Curry, T.J. & Jiobu, R.M. (1995). Do motives matter? Modeling gambling on sports among athletes. *Sociology of Sport Journal,12(1): 21-35.*
Dahlberg, L. L. & Krug, E. G. (2002). Violence-a global public health problem. In K. E., L. L. Dahlberg, J. A. Mercy, A. B. Zwi, & R. Lozano (Eds.), World Report on Violence and Health (pp. 1-56). Geneva, Switzerland: World Health Organization.
Daitzman, R. J. & Zuckerman, M. (1980). Disinhibitory sensation seeking and gonadal hormones. *Personality and Individual Differences*, *1*, 103-110.
Donovan, C. & McEwan, R. (1995). A review of the literature examining the relationship between alcohol use and HIV-related sexual risk-taking in young people. *Addiction,*90: 319-328.
Engwall, D., Hunter, R., & Steinberg, M. (2004). Gambling and other risk behaviors on university campuses. *Journal of American College Health*, *52*(6), 245-255.
Ertelt, S. (2007). More College Athletes Have Abortions to Avoid Losing Scholarships. *Lifenews.com* www.lifenews.com/nat3117.html
Eskenazi, G. (1990). Athletic Aggression. *The New York Times*, p. A27.
Etzel, E. F., Watson, J. C., Visek, A. J., & Maniar, S. D. (2006). Understanding and Promoting College Student-Athlete Health: Essential Issues for Student Affairs Professionals. *NASPA Journal*, *43*(3), 518-546.
Farley, F. (1991). The Type T Personality. In L. P. M. Lispsitt, L.L (Ed.), Self-Regulatory Behavior and Risk Taking: Causes and Consequences (pp. 371-381). Norwood, NJ: Ablex Publishing Corp.
Farley, F. (1986). The big T in personality. *Psychology Today*, *20*, 45-52.
Faurie, C., Pointer, D. and Raymond, M. (2004). Student athletes claim to have more sexual partners than other students. *Evolution and Human Behavior,* 25: 1-8.
Ferrante, A. P., Etzel, E. & Lantz, C. (1996). Counseling college student-athletes: The problem, the need. In E. F. Etzel, Ferrante, A.P. & Pinkney, J.W. (Ed.), Counseling college student athletes: Issues and Interventions (2 ed.). Morgantown, WV: Fitness Information Technology.
Fishbein, M. & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research.* Reading, MA: Addison-Wesley.
Ford, J. A. (2007). Substance use among college athletes: A Comparison based on sport/team affiliation. *Journal of American College Health*, *55*(6), 367-373.
Fritner, M. P. & Rubinson, L. (1993). Acquaintance rape: The influence of alcohol, fraternity membership and sports team membership. *Journal of Sex Education and Therapy*, *19*, 272-284.
Furby, L. & Beyth-Marom, R. (1990). Risk Taking in Adolescence: A Decision-Making Perspective. In U.S. Congress Office of Technology Assessment's Adolescent

Health Project Working Paper Series (pp. 1-70). New York: Carnegie Council on Adolescent Development.
George, W.H. & Stoner, S.A. Understanding acute alcohol effects on sexual behavior. *Annual Review of Sexual Research,* 11:92-124.
Green, G. A., Uryasz, F.D., Petr, T.A. and Bray, C.D. (2001). NCAA Study of Substance Use and Abuse Habits of College Student-Athletes. *Clinical Journal of Sport Medicine*, *11*(1), 51-56.
Grossbard, J.R., Lee, C.M., Neighbors, C., Hendershot, C.S. and Larimer, M.E. (2007). Alcohol and Risky Sex in Athletes and Non-athletes: What Roles do Sex Motives Play? *Journal of Studies on Alcohol and Drugs,*68(4): 566-574.
Gupta, R., Derevensky, J.L. & Ellenbogen, S. (2006). Personality characteristics and risk-taking tendencies among adolescent gamblers. 38(3): 201-213.
Hartman, M. & Rawson, H. E. (1992). Differences in correlates of sensation seeking in male an female athletes an non-athletes. *Personality and Individual Differences*, *13*, 805- 812.
Hildebrand, K. M., Johnson, D. J., & Bogle, K. (2001). Comparison of patterns of alcohol use between high school and college athletes and non-athletes. *College Student Journal*, *35*(3), 358-365.
Hill, K., Burch-Ragan, Kelly M. and Yates, Denise Y. (2001). Current and Future Issues and Trends Facing Student Athletes and Athletic Programs. *New Directions for Student Services*, *93*, 65-79.
Hoffman, R. (1986). Rape and the college athlete (Part 1). *Philadelphia Daily News*, p. 104.
Hoyle, R. H., Stephenson, M.T., Palmgreen, P., Pugzles-Lorch, E. & Donohew, R.L. (2002). Reliability and validity of a brief measure of sensation seeking. *Personality and Individual Differences*, *32*, 401-414.
Huang, J.-H., Jacobs, D. F., Derevensky, J. L., Gupta, R., & Paskus, T. S. (2007). Gambling and Health Risk Behaviors Among U.S. College Student-Athletes: Findings from a National Study. *Journal of Adolescent Research*, *40*, 390-397.
Huba, G. J., Newcomb, M. D., & Bentler, P. M. (1981). Comparison of canonical correlation and interbattery factor analysis on sensation seeking and drug use domains. *Applied Psychological Measurement,* 5, 291–306.
Hummer, J.F., LaBrie, J.W. & Lac, A. (2009). The prognostic power of normative influences among college student athletes. *Addictive Behaviors,* 34(6-7): 573-580.
Igra, V. & Irwin, C. E. (1996). Theories of Adolescent Risk-Taking Behavior. In R. J. Dilemente, W. B. Hansen, & L. E. Ponton (Eds.), Handbook of Adolescent Health Risk Behavior (pp. 35-48). New York: Plenum Press.
Irwin, C. E. M., S.G. (1991). Correlates and Predictors of Risk-Taking Behavior during Adolescence. In L. P. M. Lispsitt, L.L &. (Eds.), Self-Regulatory Behavior and Risk Taking: Causes and Consequences (pp. 3-21). Norwood, NJ: Ablex Publishing Corp.
Irwin, C. E. M., S.G. (1992). Correlates and Predictors of Risk-Taking Behavior during Adolescence. In L. P. M. Lispsitt, L.L. (Ed.), Self Regulatory Behavior and Risk

Taking: Causes and Consequences (pp. 3-22). Greenwood Publishing Group.
Irwin, C. E. M., S.G. (1986). Biopsychosocial correlates of risk-taking behaviors during adolescence: Can the physician intervene? *Journal of Adolescent Health Care*, *7*(Suppl), 82S-96S.
Jack, S. J. & Ronan, K.R. (1998). Sensation seeking among high and low risk sports participants. *Personality and Individual Differences*, *25*, 1063-1083.
Jackson, T. L. (1991). A university athletic department's rape and assault experiences. *Journal of College Student Development*, *32*, 77-78.
Janz, N.K. & Becker, M.H. (1984). The Health Belief Model: A Decade Later. *Health Education Quarterly,*11: 1-47.
Jessor, R. (1984). *Behavioral health: A handbook of health enhancement and disease prevention.* New York: John Wiley.
Jessor, R., & Jessor, S.L. (1977). *Problem behavior and psychosocial development: A longitudinal study of youth.* New York: Academic Press.
Joinson, C. & Nettle, D. (2005) Season of birth variation in sensation seeking in an adult population. *Personality and Individual Differences*, 38: 859-870.
Kandel, D.B. (1980). Drug and drinking behavior among youth. *Annual Review of Sociology,*6:235-285.
Kandel, D.B. (1985). On processes of peer influences in adolescent drug use: A developmental perspective. *Advances in Alcohol and Substance Abuse,* 4 (3-4): 139-163.
Kokotailo, P. K., Henry, B.C., Koscik, R.E., Fleming, M.F. & Landry, G.L. (1996). Substance Use and Other Health Risk Behaviors in Collegiate Athletes. *Clinical Journal of Sport Medicine*, *6*, 183-189.
Korcuska, J.S. & Thombs, D.L. (2003). Gender role conflict and sex-specific drinking norms: Relationships to alcohol use in undergraduate men and women. *Journal of College Student Development,* 44(2): 204-216.
Koss, M. P. & Gaines, J. A. (1993). The prediction of sexual aggression by alcohol use, athletic participation and fraternity affiliation. *Journal of Interpersonal Violence*, *8*, 94- 108.
Kueffler, J., Lim, J., and Choi, J.D. (2005). Alcohol Use among Intercollegiate Athletes. *The Sport Journal*, *8*(1).
Kuo, M., Adlaf, E. M., Lee, H., Gliksman, L., Demers, A., & Wechsler, H. (2002). More Canadian students drink but American students drink more: comparing college alcohol use in two countries. *Addiction*, *97*, 1583-1592.
Kypros, K. and Langley, J.D. (2003). Perceived social norms and their relationship to University student drinking. *Journal of Studies on Alcohol,* 64(6): 829-833.
LaBrie, J.W., Grossbard, J.R., and Hummer, J.F. (2009). Normative Misperceptions and Marijuana Use Among Male and Female College Athletes. *Journal of Applied Sport Psychology,* 21(Suppl. 1): S77-S85.
LaGreca, A.M., Prinstein, M.J. and Fetter, M.D. (2001). Adolescent peer crowd affiliation: Linkages with health-risk behaviors and close friendships. *Journal of Pediatric Psychology,* 26(3): 131-143.

Lamson-Monthley, H. (1995). Lifestyle and Health Behaviors of College Student-Athletes in a Selected Population at Five Division II Universities. *Unpublished Dissertation.* The Pennsylvania State University.

Larimer, M.E., Turner, A.P., Mallett, K.A. and Geisner, I.M. (2004). Predicting drinking behavior and alcohol-related problems among fraternity and sorority members: Examing the role of descriptive and injunctive norms. *Psychology of Addictive Behaviors,*18(3): 203-212.

Larimer, M.E., Irvine, D.L., Kilmer, J.R., & Marlatt, G.A. (1997). College drinking and the Greek system: Examining the role of perceived norms for high-risk behavior. *Journal of College Student Development,* 38: 587-598.

Lanning, W. (1982). The privileged few: Special counseling needs of athletes. *Journal of Sport Psychology*, *4*, 19-23.

Leichliter, J. S., Meilman, P.W., Presley, C.A. & Cashin, J.R. (1998). Alcohol Use and related consequences among students with varying levels of involvement with college athletics. *Journal of American College Health*, *46*, 257-262.

Lewis, M.A. & Neighbors, C. (2006). Social norms approaches using descriptive drinking norms education: A review of the research on personalized normative feedback. *Journal of American College Health,* 54: 213-218.

Lisha, N.E. and Sussman, S. (2010). Relationship of high school and college sports participation with alcohol, tobacco and illicit drug use: A review. *Addictive Behaviors,*35: 399-407.

Maisto, S.A., Carey, M.P., Carey, K.B. and Gordon, C.M. (2002). The effects of alcohol and expectancies on risk perception and behavioral skills relevant to safer sex among heterosexual young adult women. *Journal of studies on Alcohol,*63: 476-485.

Marcello, R. J., Danish, S.J. & Stolberg, A.L. (1989). An evaluation of strategies developed to prevent substance abuse among student-athletes. *Sport Psychologist*, *3*, 196-211.

Martens, M. P., Cox, R.H. & Beck, N.C. (2003). Negative Consequences of Intercollegiate Athlete Drinking: The Role of Drinking Motives. *Journal of Studies on Alcohol*, *64*(6), 825-829.

Martens, M.P., Page, J.C., Mowry, E.S., Damann, K.M., Taylor, K.K. and Cimini, M. D. (2006). Differences between actual and perceived student norms: An examination of alcohol use, drug use and sexual behavior. *Journal of American College Health*, 54(5): 295-300.

Martens, M. P., Dams-O'Connor, K. & Beck, N.C. (2006). A systematic review of college student-athlete drinking: Prevalence rates, sport-related factors, and interventions. *Journal of Substance Abuse Treatment*, *31*, 305-316.

Martens, M. P., Watson, J.C. & Beck, N.C. (2006). Sport-type differences in alcohol use among intercollegiate athletes. *Journal of Applied Sport Psychology*, *18*, 136-150.

Martin, M. (1998). The use of alcohol among NCAA Division I female college basketball, softball and volleyball athletes. *Journal of Athletic Training*, *33*, 163-167.

Mays, D., Thompson, N., Kushner, H.I., Mays, D.F., Farmer, D. and Windle, M. (2010). Sports-specific factors, perceived peer drinking, and alcohol-related behaviors among adolescents participating in school based sports in Southwest Georgia. *Addictive Behaviors,*35: 235-241.

Miller, B. E., Miller, M. N., Verhegge, R., Linville, H. H., & Pumariega, A. J. (2002). Alcohol Misuse Among College Athletes: Self Medication for Psychiatric Symptoms? *Journal of Drug Education*, *32*(1), 41-52.

Miller, E. T., Neal, D.J., Roberts, L.J., Baer, J.S., Cressler, S.O., Metrik, J. & Marlatt, G.A. (2002). Test-retest reliability of alcohol measures: Is there a difference between internet- based assessment and traditional methods? *Psychology of Addictive Behaviors*, *16*, 56-63.

Miller, D.T. & McFarland, C. (1991). When social comparison goes awry: The case of pluralistic ignorance. In J. Suls & T. Wills (Eds.), *Social Comparison: Contemporary Theory and Research* (pp. 287-313). Hillsdale, NJ. Erlbaum.

(1995). Morbidity and Mortality Weekly Report (MMWR).

(1997). Morbidity and Mortality Weekly Report (MMWR).

Morrongiello, B. A. & Rennie, H. (1998). Why do Boys Engage in More Risk Taking Than Girls? The Role of Attributions, Beliefs and Risk Appraisals. *Journal of Pediatric Psychology*, *23*, 33-45.

Mott, F. L. H., R.J. (1987). *The inter-relatedness of age at first intercourse, early pregnancy and drug use among American adolescents: preliminary results fro the National Longitudinal Survey of Youth Labor Market Experience*. Paper presented at the Population Association of American, Chicago.

Website., N. A. I. A. http://naia.cstv.com

Association, NCAA (2003). *NCAA National Study of Collegiate Sports Wagering and Associated Behaviors*. Kansas City, MO: NCAA.

Nattiv, A., & Puffer, J.C. (1991). Lifestyles and health risks of collegiate athletes. *Journal of Family Practice*, *33*(5), 585-.

Nattiv, A., Puffer, J.C. & Green, G.A. (1997). Lifestyles and health risks of collegiate athletes: A multi-center study. *Clinical Journal of Sport Medicine*, *7*, 262-272.

NCAA (2006). *NCAA Study of Substance Use Habits of College Student-Athletes*. Paper presented at the The National Collegiate Athletic Association Committee on Competitive Safeguards and Medical Aspects of Sports.

NCAA (2001). *NCAA Study of Substance Use Habits of College Student-Athletes*. Paper presented at the The National Collegiate Athletic Association Committee on Competitive Safeguards and Medical Aspects of Sports.

Neighbors, C., Geisner, I.M., & Lee, C.M. (2008). Perceived marijuana norms and social expectancies among entering college student marijuana users. *Psychology of Addictive Behaviors,* 22: 433-438.

Neighbors, C., Lee, C.M., Lewis, M.A., Fossos, N. and Larimer, M.E. (2007). Are social norms the best predictor of outcomes among heavy drinking college students? *Journal of Studies on Alcohol and Drugs,* 68: 556-565.

Nelson, T. F. & Wechsler, H. (2001). Alcohol and College Athletes. *Medicine & Science*

in Sports & Exercise, *33*(1), 43-47.
Nsuami, M., Elie, M., Brooks, BN, et al. (2003). Screening for Sexually Transmitted Diseases During Pre-participation Sports Examination of High School Adolescents. *Journal of Adolescent Health*; 32(5): 336-339.
O'Sullivan, D. M., Zuckerman, M., & Kraft, M. (1998). Personality Characteristics of male and female participants in team sports. *Personality and Individual Differences*, *25*, 119- 128.
Overman, S. J. & Terry, T. (1991). Alcohol Use and Attitudes: A Comparison of College Athletes and Nonathletes. *Journal of Drug Education*, *21*(2), 107-117.
Page, R.M. & Roland, M. (2004). Misperceptions of the prevalence of marijuana use among college students: Athletes and non-athletes. *Journal of Child and Adolescent Substance Abuse,* 14: 61-75.
Parham, W. D. (1993). The intercollegiate athlete: A 1990's profile. *Counseling Psychologist*, *21*, 411-429.
Perkins, H.W. & Berkowitz, A.D. (1986). Perceiving the community norms of alcohol use among students: Some research implications for campus alcohol education programming. *International Journal of the Addictions,*21: 961-976.
Perkins, H. W., Meilman, P.W., Leichliter, J.S., Cashin, M.A. & Presley, C.A. (1999). Misperceptions of the norms for the frequency of alcohol and other drug use on college campuses. *Journal of American College Health,*47: 253-258.
Perkins, H. W. (2002). Social norms and the prevention of alcohol misuse in collegiate contexts. *Journal of Studies on Alcohol,* Suppl. 14: 164-172.
Perkins, H.W., Haines, M.P. and Rice, R. (2005). Misperceiving the college drinking norm and related problems: A nationwide study of exposure to prevention information, perceived norms and student alcohol misuse. *Journal of Studies on Alcohol,*66(4): 470-478.
Perkins, H.W. (1995). Religious tradition, parents and peers as determinants of alcohol and drug use among college students. *Religious Research,* 27: 15-31.
Perkins, H.W. & Wechsler, H. (1996). Variation in perceived college drinking norms and its impact on alcohol abuse: A nationwide study. *Journal of Drug Issues,* 26: 961-974.
Pfefferbaum, B. & Wood, P. B. (1994). Self-report study of impulsive and delinquent behavior in college students. *Journal of Adolescent Health*, *15*(4), 295-302.
Pinkerton, R., Hinz, L., & Barrow, J. (1989). The college student athlete: psychological considerations and interventions. *Journal of American College Health*, *37*, 218-226.
Pritchard, M. E., Milligan, B.A., Elgin, J., Rush, P., & Shea, M. (2007). Comparisons of Risky Health Behaviors between Male and Female College Athletes and Non-athletes. *Athletic Insight*, *91*(1).
Ravert, R.D., Schwartz, S.J., Zamboanga, B.L., Kim, S.Y., Weisskirch, R.S. and Bersamin, M. (2009). Sensation seeking and danger invulnerability: Paths to college student risk-taking. *Personality and Individual Differences,* 47: 763-768.
Raynor, D.A. and Levine, H. (2009). Associations Between Five Factor Model of Personality and Health Behaviors Among College Students. *Journal of American*

College Health, 58(1): 73-81.
Rimal, R.N. and Real, K. (2003). Understanding the Influence of Perceived Norms on Behaviors. *Communication Theory,* 13(2): 184-203.
Roberti, J. W. (2004). A review of behavioral and biological correlates of sensation seeking. *Journal of Research in Personality*, *38*, 256-279.
Rogers, R.W. (1975). A protection motivation theory of fear appeals and attitude change. *Journal of Psychology,* 91: 93-114.
Rotella, R. & Heyman, S. (1986). Stress, Injury and the psychological rehabilitation of athletes. In J. M. Williams (Ed.), Applied sport psychology: Personal growth to peak performance. Palo Alto, CA: Mayfield.
Rowland, G. L., Franken, R.E., Harrison, K. (1986). Sensation Seeking and Participation in Sporting Activities. *Journal of Sport and Exerercise*, *8*(3), 212-221.
Schottman, S. (2008). NAIA.
Schroth, M. L. (1995). A comparison of sensation seeking among different groups of athletes and nonathletes. *Personality and Individual Differences*, *18*, 219-222.
Selby, R., Weinstein, H. M., & Stewart, T. (1990). The Health of University Athletes: Attitudes, Behaviors and Stressors. *Journal of American College Health*, *39*, 11-18.
Shirazi, A. & Tricker, R. (2005). Current Drug Education Policies in NCAA Institutions: Perceptions of Head Athletic Trainers. *Journal of Drug Education*, *35*(1), 29-46.
Simons, J.S. & Carey, K.B. (2006). An effective and cognitive model for marijuana and alcohol problems. *Addictive Behaviors,*31: 1578-1592.
Staff. (2007). Longhorn football players arrested on drug charges. *Austin American Statesman* www.statesman.com
Steinberg, L. & Belsky, J. (1996). An Evolutionary Perspective on Psychopathology in Adolescence. In D. Cicchetti & S. L. Toth (Eds.), Adolescence: Opportunities and Challenges (pp. 93-124). Boydell & Brewer.
Straub, W. F. (1982). Sensation Seeking among High and Low Risk Male Athletes. *Journal of Sport Psychology*, *4*(3), 246-253.
Swoap, R. A. & Murphy, S. M. (1995). Eating Disorders an Weight Management in Athletes. *Sport Psychology Interventions,* 307-329.
Thombs, D. L. (2000). A test of the perceived norms model to explain drinking patterns among university student athletes. *American College Health*, *49*, 75-83.
Thombs, D.L., Wolcott, B.J. and Farkash, L.G.E. (1997). Social context, perceived norms and drinking behavior in young people. *Journal of Substance Abuse,* 9: 257-267.
Thuen, F. (1994). Injury-related behaviors and sensation seeking: An empirical study of a group of 14-year old Norwegian school children. *Health Education Research*, *9*, 465-472.
Udry, J. R. (1988). Biological predispositions and social control in adolescent sexual behavior. *American Sociological Review*, *53*, 709-722.
Udry, J. R. T., L.M. (1988). Sex hormone effects on personality at puberty. *Journal of Personality and Social Psychology*, *51*, 291-295.
Watel, P.-P., Guagliardo, V., Verger, P., Pruvost, J., Mignon, P., & Obadia, Y. (2003). Sporting Activity and Drug Use: Alcohol, Cigarette and Cannabis Use Among Elite

Student Athletes. *Addiction*, *98*, 1249-1256.
Watson, J. C. (2007). Assessing the potential for alcohol-related issues among college student-athletes. *Athletic Insight (Online Journal of Sport Psychology)*, *14*(3).
Webster free online dictionary (2010). http://www.merriam-webster.com/dictionary/norm
Wechsler, H., Kuo, M., Lee, H., & Dowdall, G. W. (2000). Environmental correlates of underage alcohol use and related problems of college students. *American Journal of Preventative Medicine*, *19*, 24-29.
Wechsler, H., Davenport, A.E., Dowdall, W., Grossman, S.J. and Zanakos, S.I. (1997). Binge Drinking, Tobacco, and Illicit Drug Use and Involvement in College Athletics. *Journal of American College Health*, *45*(5), 195-.
Weinhardt, L.S. & Carey, M.P. (2000). Does alcohol lead to sexual risk behavior? Finding from event-level research. *Annual Review of Sexual Research,* 11:125-157.
Weinstein, N.D. (1989). Perceptions of personal susceptibility to harm. In V. Mays, G. Albee & S. Schneider (Eds.), *Primary Prevention of AIDS* (pp. 142-167). Beverly Hills, CA: Sage.
Weinstein, N.D. & Nicolich, M. (1993). Correct and incorrect interpretations of correlations between risk perceptions and risk behaviors. *Health Psychology,*12: 235-245.
Wetherill, R.R. & Fromme, K. (2007). Alcohol use, sexual activity and perceived risk in high school athletes and non-athletes. *Journal of Adolescent Health,* 41(3): 294-301.
Wiley, D., James, G., Furney, S., Jordan-Belver, C., Calsbeek, F., Benjamin, J. & Kathcart, T. (1996). Assessing the Health Behaviors of Texas College Students. *Journal of American College Health*, *44*(4), 167-172.
Yanovitzky, I. (2006). Sensation Seeking and Alcohol Use by College Students: Examining Multiple Pathways of Effects. *Journal of Health Communication*, 11: 269-280.
Yusko, D.A., Buckman, J.F., White, H.R. and Pandina, R.J. (2008). Risk for excessive alcohol use and drinking related problems in college student athletes. *Addictive Behaviors*, 33: 1546-1556.
Zamboanga, B. L. & Ham, L. S. (2008). Alcohol Expectancies and Context-Specific Drinking Behaviors Among Female College Athletes. *Behavior Therapy*, *39*, 162-170.
Zimbalist, A. (1999). *Unpaid Professionals: Commercialism and Conflict in Big-Time College Sports*. Princeton, NJ: Princeton University Press.
Zuckerman, M. (1979). Sensation seeking and risk-taking. In C. E. Izard (Ed.), Emotions in personality and psychopathology. (pp. 163-197). New York: Plenum Press.
Zuckerman, M. (1991). Sensation Seeking: The Balance Between Risk and Reward. In L. P. M. Lispsitt, L.L. (Ed.), Self Regulatory Behavior and Risk Taking: Causes and Consequences (pp. 143-152). Norwood, NJ: Ablex Publishing Corp.
Zuckerman, M. (1969). Theoretical formulations. In J. P. Zubek (Ed.), Sensory deprivation: Fifteen years of research (pp. 407-432). New York: Appleton-Century-Crofts.

Zuckerman, M. (1971). Dimensions of sensation seeking. *Journal of Consulting and Clinical Psychology*, *36*(1), 45-52.
Zuckerman, M. (1984). The neurobiology of some dimensions of personality. In J. R. Smythies & R. J. Bradley (Eds.), International Review of Neurobiology (pp. 392-436). New York: Academic Press.
Zuckerman, M. (1987). Biological connection between sensation seeking and drug abuse. In J. Engle & L. Oreland (Eds.), Brain Reward Systems and Abuse (pp. 165-176). New York: Raven Press.
Zuckerman, M. (1994). *Behavioural expressions and biosocial bases of sensation seeking.* New York: Cambridge University Press.
Zuckerman, M. & Kuhlman, D. M. (2000). Personality and Risk Taking: Common Biosocial Factors. *Journal of Personality*, *68*, 999-1029.
Zuckerman, M. (1984). Sensation Seeking: A comparative approach to a human trait. *Behavioral and Brain Sciences*, *7*, 413-471.

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